How to Reduce Defective Production | Success Story of Ozalid's Triplex Coater | Using Sulphite Waste Liquor in Cement

PAPER TRADE JOURNAL

JANUARY 16, 1956

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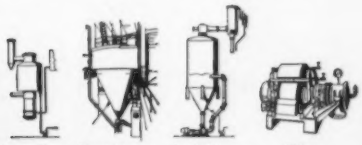

Evaporators Spray Dryers Crystallizers Filters

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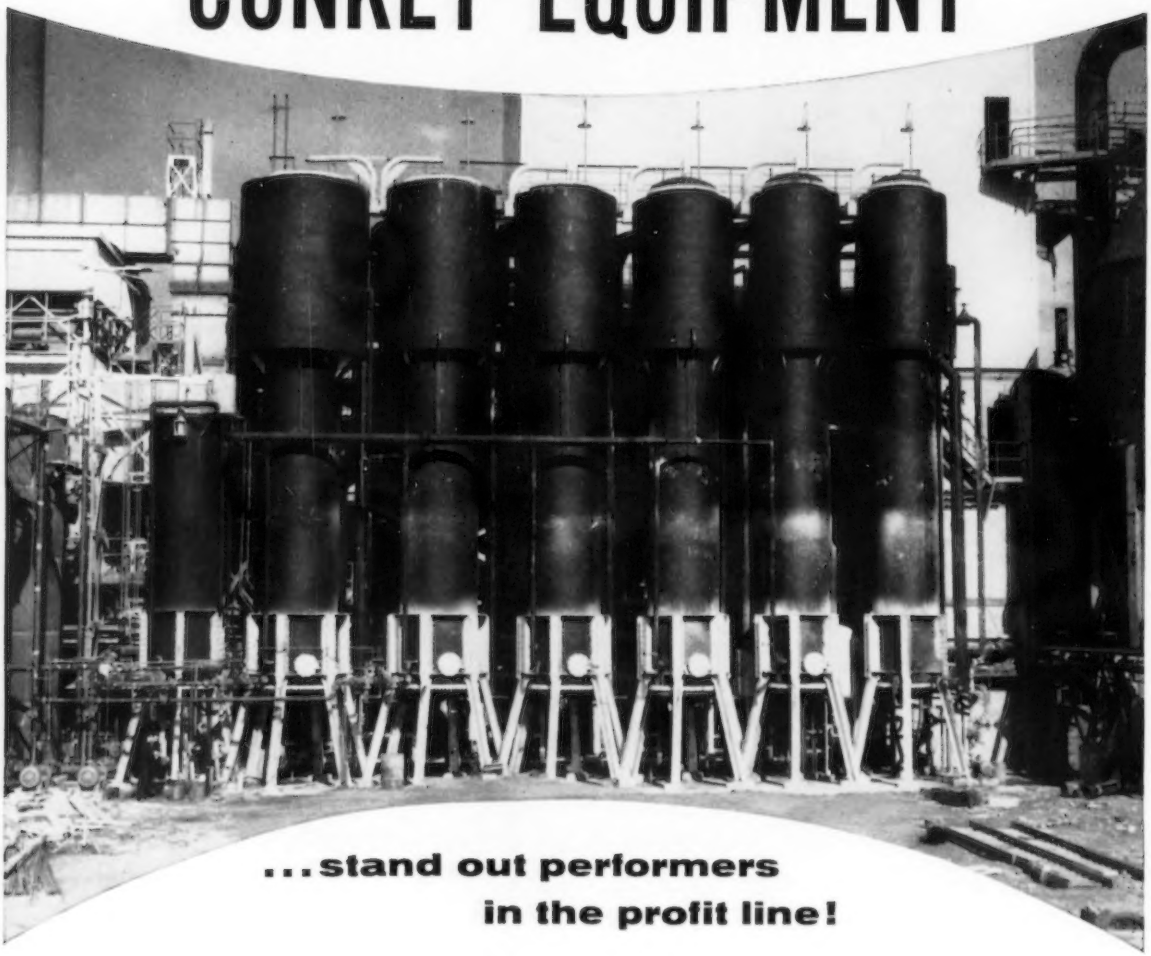

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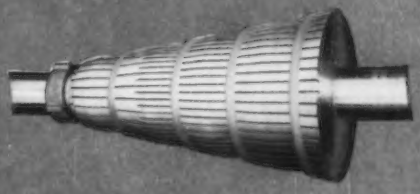

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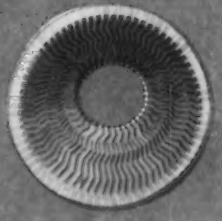

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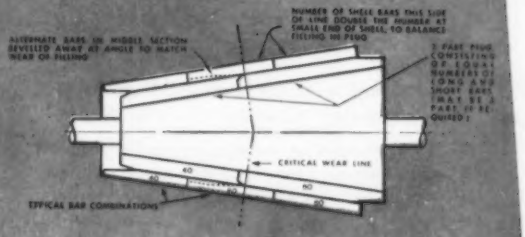

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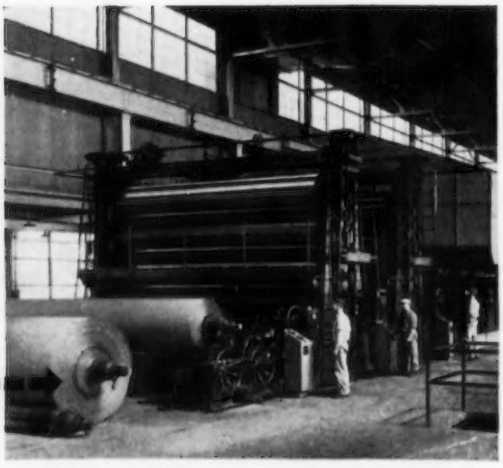

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REMEMBER THESE DATES

JAN. 25-27: Canadian Pulp & Paper Assn., Montreal, Que., Canada.

FEB. 19-24: Paper Week in New York City.

FEB. 19-24: Annual Meeting American Paper and Pulp Assn., Waldorf-Astoria, New York, N. Y.

FEB. 20-23: Technical Assn. of Pulp and Paper Industry Annual Meeting, Hotel Commodore, New York, N. Y.

MAY 7-9: Coating Conference, Benjamin Franklin Hotel, Philadelphia, Pa.

PAPER TRADE JOURNAL

Published Weekly Since 1872

January 16, 1956, *Vol. 140, No. 3*

TRENDS 9

NEWS BRIEFS

Hearst Decides Soon About N. S. Mill 13

West Va.'s New Charleston Machine Set 13

Lumber Co. Pushes for Arizona Mill 14

FEATURE ARTICLES

How You Can Reduce Defective Paper Production 18

Here's how to establish short and long range controls that will reduce your seconds and broke.

Sulphite Waste Liquor in Cement Manufacture 20

An authoritative discussion of this important outlet for sulphite waste liquor.

Ozalid's Triplex Coater Proves Success of Unusual Design 26

A case history of a new and exceptionally versatile coating machine for diazo sensitive papers.

NEW EQUIPMENT AND SUPPLIES 30

PAPER PEOPLE 32

NEWS OF ASSOCIATIONS 36

NEWS OF CONVERTERS 38

PRICES OF FIBERS AND MATERIALS 40

OBITUARIES 42

NEWS OF SUPPLIERS 46

FIGURES OF THE WEEK 46

CLASSIFIED ADVERTISING 48

ADVERTISERS INDEX 54

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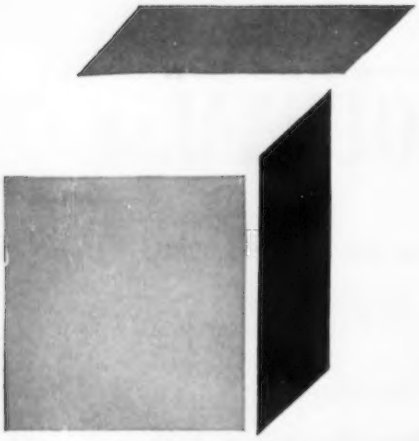

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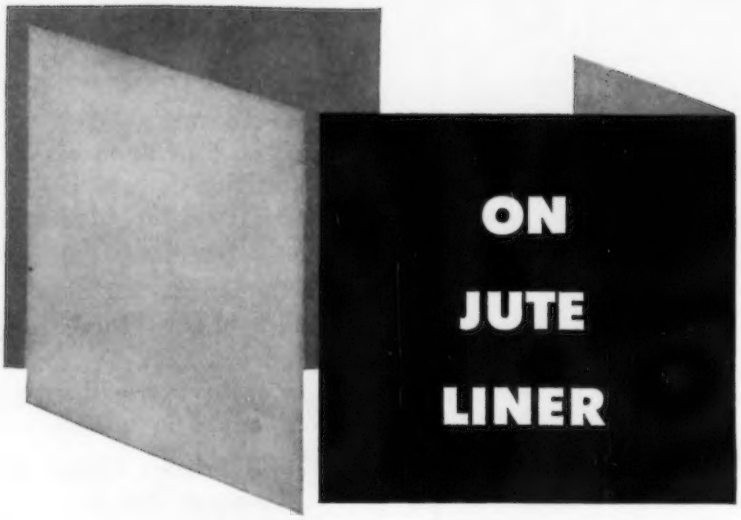

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FIG. 2193—Large Size Ni-Resist O.S. & Y. Gate Valve for 200 Pounds W.O.G.

FIG. 2491—Stainless Steel O.S. & Y. Gate Valve for 150 Pounds W.P.

FIG. 2608—Bronze Full Flow Globe Valve for 200 Pounds W.S.P.

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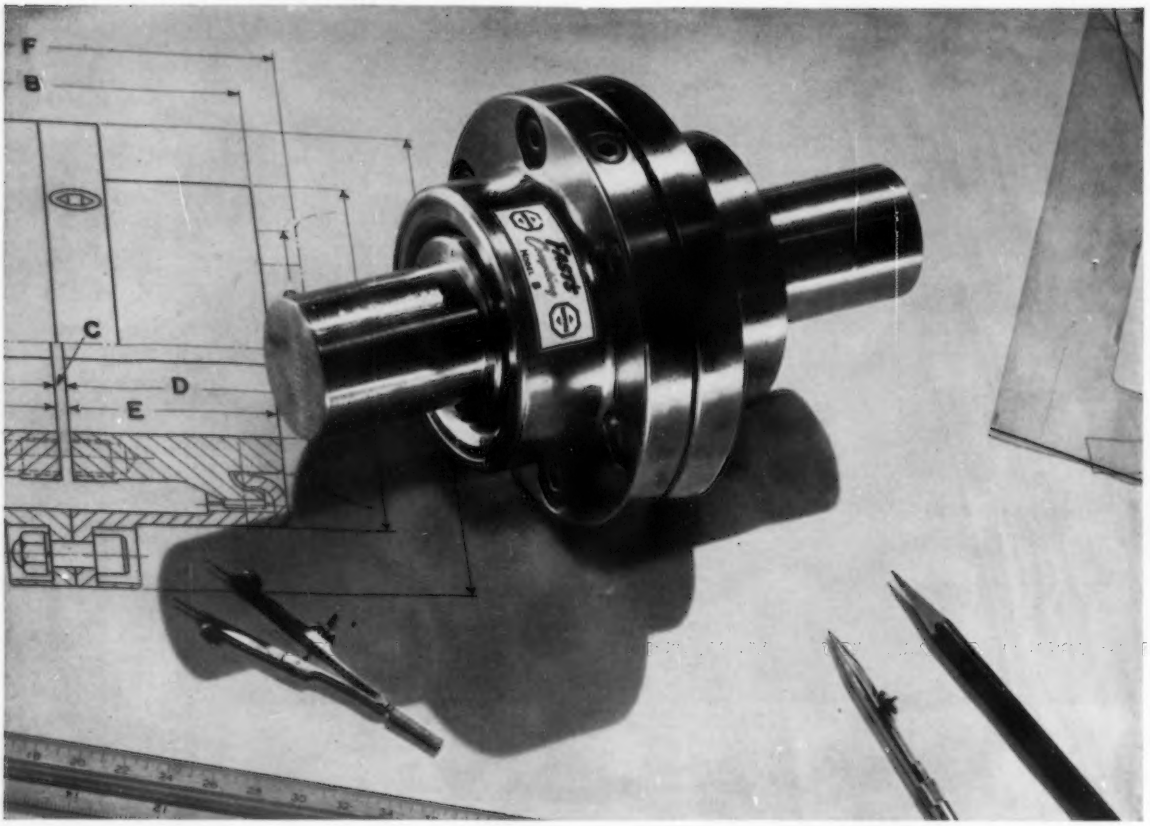
BRONZE, IRON, STEEL AND CORROSION RESISTANT VALVES.



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Business Spending To Bolster Economy

Chief source of strength in the business year ahead will come from heavy capital outlays for new plants and equipment. Spending of this sort will do much to offset any easing in consumer demand in the latter half. Capital investment reached a record rate of $31 billion in the fourth quarter of 1955, 18 per cent above the previous year. According to present spending schedules, capital outlays will top all previous levels during 1956.

Canadians Hold Newsprint Uneconomical

An unexpressed opinion of some Canadian paper producers today is that newsprint is becoming an uneconomical commodity, especially at today's prices. Reason for the view is the remarkable rise in new construction costs together with substantial power boosts. Mill labor's wage has risen too, some 20 per cent in three years (since the last price increase), and wood costs, which account for 75 per cent of total production costs, have risen 25 per cent during the same period. Also mentioned is that direct water-power concessions are almost impossible to get today.

Capacity Totals Show Tempo Rise

Production to mill capacity comparisons for the year just ended show a December level of 91 per cent for paper as against 86 per cent for December 1954. Paper totals for all of 1955 ran to 95 per cent of capacity as compared with 92 per cent for the year earlier. Board mills operated at a 92 per cent December rate which was 10 per cent above the 1954 level. The total board rate for 1955 was 96 per cent of rated capacity, 8 per cent over 1954.

Waste Paper Soars To New Levels

Eastern mills purchased and consumed more wastepaper stock in 1955 than any previous year in the history of the industry. National consumption for the year topped the previous 1951 record by nearly one half million tons. Of total grades consumed in the East, 31 per cent was in container grades; 28 per cent in news; 26 per cent in mixed; and 15 per cent in high grades.

Survey Records P&P Pollution Projects

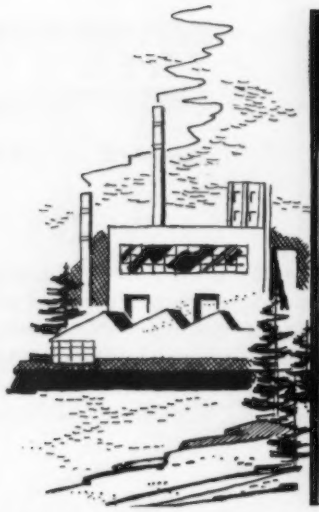
A survey of pulp and paper manufacturers put out at the end of last year indicates 55 per cent of 486 pulp and paper manufacturers have waste treatment plants for stream pollution abatement. Over the past 10 years, more than $75 million has been spent by these firms to build these facilities.

Canadians Produce New Dollar High

The Canadian pulp and paper industry chalked a new output record last year, with estimated production placed at a $1,290 million value, some 7½ per cent above the dollar total for 1954.

Subsidy To Encourage French Newsprint

A $4½ million dollar subsidy fund has been advocated by the French Government for the newsprint industry in that country. The money will be used to bring the price down to match imports, and to encourage future production above current levels with a premium payment of $4 per long ton.



HOW Texrope Drives Save Money

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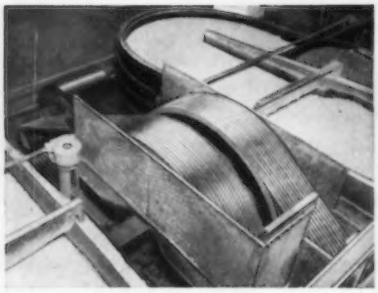
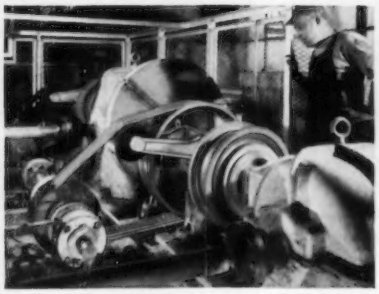
Low-Cost Speed Control—Motion control *Vari-Pitch* drives are the low-cost way of synchronizing paper machine sections. Speed control is accurate within 1%. No need for expensive, special motors and electrical control.

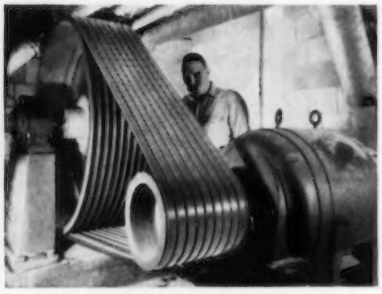
Operation of a handwheel, conveniently located, increases or decreases the pitch diameter of the *Vari-Pitch* sheave, varying the speed. Remote control or centralized operation of the speed-changing mechanism can be provided.



Beater Drives — Long-lasting *Texrope* drives for beaters are found in many paper mills. This *Texrope* drive has been in successful operation since 1938. It consists of 72-inch and 16-inch sheaves with 8-foot center distance.



Calender Stack and Drum Reel Drive — This low-cost *Vari-Pitch* drive permits smooth stepless speed changes during operation to compensate for changes in grade of paper. Another type is built for easy readjusting when machine is at rest.



Blender Drive — *Texrope* drives like this are widely used in paper mills because they are clean, efficient and easy to maintain. They are also resilient — dampen vibration and shock. Available in almost infinite range of capacities.

GET NEW BOOKLET Contact your nearby A-C distributor or District Office for a copy of the new booklet, "*Texrope* Drives for Paper Mills." It will pay you to have full information about A-C service and equipment. For Allis-Chalmers has both the widest line of V-belt drive equipment and the broadest engineering experience in the industry. Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

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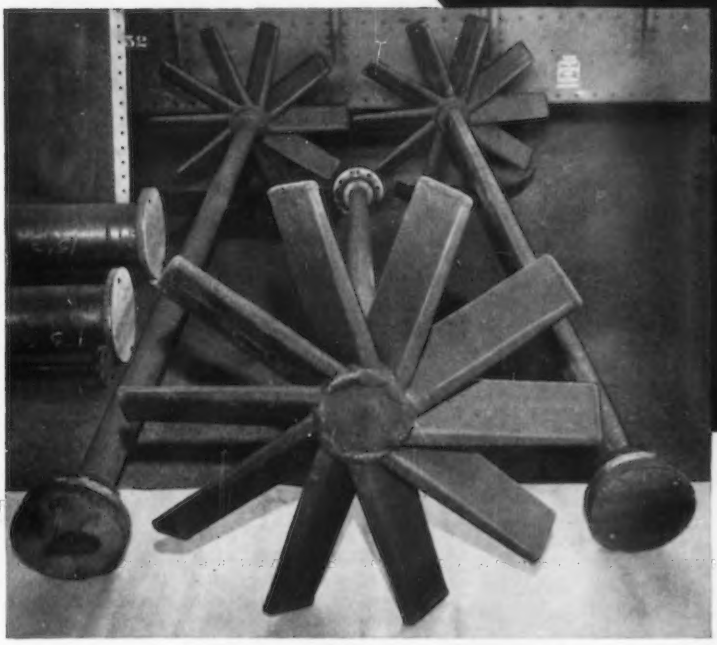

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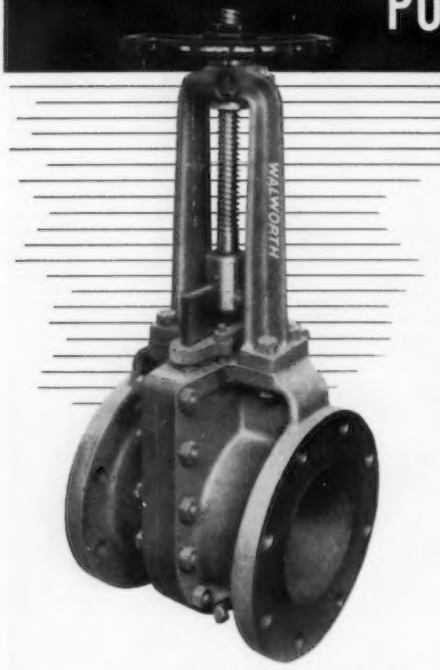

Featuring the No. 757F Pulp Stock Valve!

Here's the valve that was developed especially for clogproof operation on stock lines. There are no recesses where pulp fibers can accumulate. Circular ports permit full flow. The sharp, flame-hardened edge of the semicircular stainless steel gate shears through the pulp stock to a tight, leakproof shutoff.

The No. 757F can be supplied in sizes 4" to 24" inclusive – in All Bronze, Iron Body with Bronze Trim, Iron Body with Stainless Steel Trim, All Stainless Steel construction. Complete information is available from your nearby Walworth Distributor – or – write Walworth direct for a free copy of the booklet, "Walworth Valves for Pulp and Paper Mill Service".

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WALWORTH 928FS SPECIAL ALLOY SWING CHECK VALVES. Designed for the severe corrosive services encountered in the pulp and paper industry.

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Hearst About To Decide On Proposed Nova Scotia Mill

The life or stillbirth of the proposed new newsprint mill for Nova Scotia likely will be decided by the end of January.

The N.S. government will soon submit its proposals in regard to power, steam and timber for the mill to Hearst Publishing Co. interests.

Agreement revolves chiefly on price the Hearst group would have to pay for power and steam. It is understood the Hearst interests are eyeing the province of Ontario for establishment of a mill if negotiations break down.

The proposed newsprint mill at Sheet Harbor, on the eastern shore about halfway between Canso and Halifax, would have an initial capacity of 225 tons of newsprint per day with an ultimate capacity of 250 to 275 tons. Capital expenditures would be some $10 million.

The newsprint mill would require a daily average load of some 20,000 kw. It is understood the Government is prepared to build such a power plant at Sheet Harbor.

Actually, one source suggests the Government is thinking in terms of a 40,000 kw. station to allow more flexibility in operations. It would be built by the Nova Scotia Power Commission and power not supplied to the mill could be transmitted to Trenton, N.S., and other areas where the N.S. Commission has a generating station.

The Hearst group has made representations to the N. S. Government that it would require sufficient timber to support a 225-ton mill in perpetuity. At present Hearst controls a groundwood mill at Sheet Harbor with a daily capacity of some 100 tons. Some of the timberlands owned by the company would be used to supply the proposed mill, but these are considered insufficient to sustain the new operation.

Consequently, some decision would have to be made by the N.S. Government as to Crown lands for lease to Hearst.

But the big question appears to be power and steam at what Hearst considers the right price.

New Charleston Machine To Make Lighter West Va. Grades

West Virginia Pulp & Paper Co. predicts that its most important single component of capital outlays for 1956 will be spent toward a third large kraft machine at the Charleston, S. C., mill on which preliminary construction already has begun. Cost of the Charleston machine, with supporting equipment, including additional power, will run nearly $20 million. The new machine is expected to begin production by August 1957.

The new equipment will give Charleston a lineup of three of the largest and most modern paper machines in the industry, enabling the mill to increase production from its present daily capacity of 955 tons to 1,350 tons per day.

The new Beloit fourdrinier will manufacture lighter grades of kraft paper, allowing one of the existing machines to concentrate on the production of kraft linerboard and the other to establish a more uniform order pattern for heavier weight kraft paper and lighter weight paperboard.

Other significant projects scheduled by West Virginia for 1956 include the rebuilding of two paper machines at the Covington, Va., mill which make corrugating medium for shipping containers, and the construction of another new box factory for H & D at Eaton, Ohio, and a number of smaller jobs designed to produce significant improvements in quality and increases in capacity at other mills of the company.

C-Z Plans Terminal Warehouse

Crown Zellerbach Paper Corp. has made an offer of $375,000 to the Port of Portland, Ore. for 33.66 acres of waterfront land on N. W. Front Ave.

Crown-Zellerbach proposes to build a modern terminal on this site for the receiving, warehousing, packing and shipping of paper products from its mills at Camas, Wash. and West Linn, Ore.

The investment for the first phase of the development, according to John Fulton, corporate representative and director of purchases in Portland, will approximate two million dollars.

Form Pulp and Paper Prepackaging Assn.

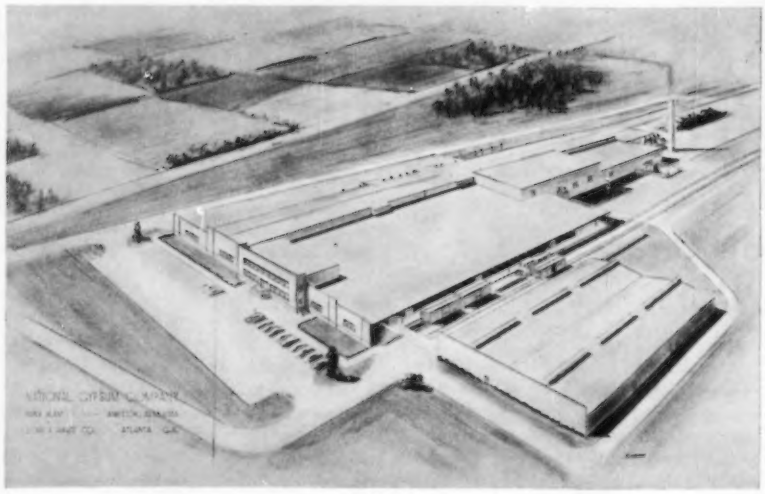
Leading manufacturers of meat boards and trays used to prepack food for display in grocery stores and supermarkets have formed an industry trade group known as the Pulp and Paper Prepackaging Assn.

The association's objectives are "to promote the use of pulp and paperboard products for prepackaging self-service meats, produce, fruit, and other food products and to cooperate with customer-industry groups in advancing the application and marketing of these prepackaging materials."

Organizing officers are: president, E. B. Howard, The Diamond Match Co.; vice-president, H. T. Epstein, Proven Paper Manufacturing Co.; secretary-treasurer, R. W. Bertram, Marathon Corp. The board of directors will consist of the foregoing three officers and Harlan Longnecker of the Sutherland Paper Co. and H. D. Archibald of the Keyes Fibre Sales Co. Arlo Wilson will act as executive secretary, with headquarters at 122 East 42nd Street, New York 17, N. Y.

According to Mr. Howard, "prepackaging of fresh meats and other food products on board and trays in food markets is growing rapidly, and it is believed that the industry has a great potentiality for enormous growth in the near future."

Members of the association include: American Paper Specialty Co., Pittsburgh, Pa.; Diamond Match Co., New York; Keyes Fibre Sales Co., New York; Mopes Molded Pulp Division, Central Fibre Products Co., Griffith, Ind.; Mullen Container Corp., Chicago; Marathon Corp., Menasha, Wis.; Murname Paper Co., Chicago; Pak-R-Board Corp., Marshall, Mich.; Proven Paper Manufacturing Co., Boston; Sutherland Paper Co., Kalamazoo, Mich.



PREVIEW OF NEW ANNISTON MILL — National Gypsum Co.'s new paper mill at Anniston, Ala. will look like this when completed next July. The 155,000 sq. ft. plant will produce 200 tons of paper daily for covering gypsum wallboard products made at the company's plants at Westwego, La.; Savannah, Ga.; Shoels, Ind.; Baltimore, Md.; and Burlington, N. J. . . . The building on the right is a waste paper warehouse. The waste paper will be unloaded by railroad car and truck in the area in the right center of the drawing. Finished paper will be loaded into railroad cars at the far left of the plant. The 7,000 sq. ft. two-story office building is in the center of the sketch.

Arizona Lumber Co. Seeks Pulp & Paper Mill Site

Southwest Lumber Mills, Inc., Arizona's biggest lumber manufacturing concern, is venturing into the pulp and paper field.

Southwest's president, J. B. Edens, announced that a search is being made for a site with a water supply of 20 million gallons a day, not too far away from adequate supplies of log and sawmill waste. Another requisite, he adds, is "adequate financing." This is taken to indicate that a subsidiary will be formed to build and operate the paper plant if it materializes.

The present studies, according to Mr. Edens, are based on a Forest Service report that enough wood exists in northern Arizona for the manufacture of 1000 tons of paper daily without reducing pine stands faster than they are replaced by natural growth.

Champion Containers Now Ohio Box Subsidiary

Champion Containers, Inc., at Plymouth, Mich., has been organized as a wholly owned subsidiary of the Ohio Boxboard Co., Rittman, Ohio. The new company has acquired the plant and other assets of Champion Corrugated Corp., and will manufacture and sell corrugated containers in the Detroit area.

S. F. Allison, vice-president in charge of container operations for the parent company, said that the Plymouth operation will enable Ohio Boxboard to better serve its customers in this area and accept additional accounts which it was previously unable to serve from its other plants. Mr. Allison said the personnel of the former Champion Corrugated Container Corp. will operate the new corporation under the direction of General Manager J. J. McFalda.

Paper and Board Production

According to the American Paper and Pulp Association, the ratio of the United States production to mill capacity for the week ending December 31, 1955, was 69.1 percent, compared with 89.7 percent, revised, for the preceding week. The ratio was 70.5 percent for the corresponding week a year ago.

The paperboard production ratio for the week ending December 31, 1955, was 56 percent, compared with 101 percent for the preceding week, and 47 percent for the corresponding week last year. The sharp decline in operating is due to the Christmas holiday.

(Detailed statistics on page 46.)

Bowaters Southern Furthers Erection of New Buildings

The J. A. Jones Construction Co. of Charlotte, N. C., has reported that work was started January 3 on a contract it holds for expanding the plant of the Bowaters southern newsprint mill in Calhoun, Tenn.

The Jones contract mainly involves enclosing additions to four buildings with masonry and concrete. The foundation and steel already are in place.

The new structures, about 1,500 feet long and 150 wide, will about double the capacity of the plant. The Jones firm expects to complete its building work by about July 1.

I. P. Completes New Bleach Plant at Ticonderoga

The Ticonderoga, N. Y. mill of International Paper Co. has a new bleach plant that has been under design and construction for over a year and will have a rated capacity of 125 tons of bleached pulp a day as compared with 65 tons a day in the old bleach plant.

The new unit is designed to product a brighter and stronger pulp. In addition, it will enable the mill to utilize more of the wood species grown and cut in the Ticonderoga area. This, in turn, will decrease the amount of outside pulp which will have to be purchased and will give the mill stricter control over the quality of its raw material.

The bleach plant was designed by International Paper Co. engineers who also supervised its construction.

Sixteen Paper Companies Called Excellently Managed

Sixteen companies prominent in the paper field have been certified as Excellently Managed by the American Institute of Management. Those named are: Crown-Zellerbach Corp., Champion Paper & Fibre Co., Great Northern Paper Co., Marathon Corp., St. Regis Paper Co., Scott Paper Co., Kimberly-Clark Corp., Olin Mathieson Chemical Corp., The Chillicothe Paper Co., Dixie Cup Co., Lilly-Tulip Cup Corp., West Virginia Pulp and Paper Co., Brown Co., Sutherland Paper Co., International Paper Co., and Powell River Co., Ltd. This places them among the 408 American and Canadian firms so cited by the Institute for 1955.

Eight of the firms are receiving the award for the sixth consecutive year — Crown-Zellerbach Corp., Champion Paper & Fibre Co., Great Northern Paper Co., Marathon Corp., St. Regis Paper Co., Scott Paper Co., International Paper Co., and West Virginia Pulp and Paper Co. Kimberly-Clark Corp. is receiving the designation for the fifth time in as many years and Brown Co. for the fourth.

Mr. John C. W. Evans, Editor
Paper Trade Journal
15 West 47th Street
New York 36, New York

Dear Mr. Evans:

It looks like someone dropped their rifle or else someone has been spoofing me all these years.

The article on Insulation Board Plants in the December 19th issue of *Paper Trade JOURNAL* starts with a statement that is somewhat amazing, if true, "Bagasse served as the first raw material for the manufacture of insulation board. A private corporation pioneered the development of this product and began production in 1920 at Marrero, La."

On the other hand, the Forest Products Laboratory at Madison, Wis. in September 1952 published a dissertation on "Hardboard: Process, Properties, and Potentials." On page 1 of their treatise, they made the following statement: "Developments in the fiberboard field date from 1914 when the Minnesota and Ontario Paper Co. first developed a rigid insulating board."

As a matter of fact, Bror Dahlberg, who later pioneered the use of bagasse as a fiberboard material, was with the Insulite Co. for some years before he left that organization and founded a fiberboard organization of his own in 1920.

It looks like may be the researchers should be researched.

Cordially yours,
G. H. Hardisty, Manager
Commercial Research Department
Insulite Division
Minnesota and Ontario Paper Company
500 Baker Arcade Bldg.
Minneapolis 2, Minn.

Hudson Will Test-Market Hankies

Hudson Pulp and Paper Corp. will use Columbus, Ohio as a test market during the introduction of a new Hudson product called Hudson Hankies.

The new Hudson Hankie will feature fine edge embossing that gives appearance of real lace and special emphasis has been placed on wet-strength sneeze-holding firmness. The new Hudson product will soon be introduced to consumers through extensive advertising at the local level.

MAMMOTH TANK CAR — one of the largest ever built — was lately purchased by Union Bag & Paper Corp. to transport the tall oil ("Unitol") produced at the company's Savannah, Ga. pulp mill. The company has been constructing a tall oil distillation on property adjacent to the pulp and paper mill site. . . . Of 19,000 gallon capacity, the giant car shown above, dwarfs the standard 8,000 gallon car behind it. . . . Examining the "king size" unit are (L. to R.) Malcolm L. Taylor, technical director; A. B. Doran, director of chemical sales; and W. O. Ralls Jr., superintendent of the By-Products Plant.

New Machine Enables Shut Down of Whiting No. 1 Mill

The No. 1 mill of the Whiting Paper Co. on Gatehouse Rd., Holyoke, Mass., has ceased paper production, according to company officials.

It was explained that with the new machine in the No. 2 mill on Dwight St. at the second level canal, the company can produce on two machines what used to require three.

There are two machines in the No. 1 mill, one of which has long been out of use, it was one of the original machines. The machine that has recently been discontinued has a 72 inch deckle.

With the addition of the new fourdrinier at the No. 2 mill the paper company said that present volume of production can be maintained, and by shutting down the No. 1 mill overhead can be cut. cut.

At the No. 2 mill there are three machines, two of which are in operation at all times. The third is used for special production, and when it is in operation one of the other machines is shut down.

Rayonier to Build Tall Oil Plant at Jesup

Rayonier, Inc., will build a tall oil plant at its chemical cellulose operation at Jesup, Ga., it is announced by Clyde B. Morgan, president. Tall oil is derived from wood liquor residue which is finding increasing uses in the paint, soap, paper, rubber, textile and chemical industries.

The company has entered into an arrangement with Hercules Powder under which much of the crude tall oil produced at Jesup will go to the Hercules plant at Savannah to be processed into a variety of refined products.

Rayonier's tall oil plant will utilize available raw materials from the present Jesup pulp unit, as well as from the new 100,000-ton mill now under construction there.

In addition to tall oil, Rayonier has produced crude turpentine at Jesup since the mill went into production in 1954. This production will be increased when the new mill is completed, Mr. Morgan said.

Groundwood Screening

In spite of particular care and numerous corrections on our part, the printer still managed to get an error in Dr. Klemm's article in our January 2nd issue. The error is in the formula in the lower right hand corner of page 20, the first page of the article "New Principles of Groundwood Screening". The formula should read

$$Q = \frac{a\left(\frac{1}{s}-\frac{1}{r}\right)+100\left(\frac{1}{s}-\frac{1}{x}\right)}{6} =$$

oz.
U.S.G.P.M. per daily ton

American Box Board Plans New Office Building

American Box Board Co. plans to erect a new office building adjacent to the Furniture Museum in Grand Rapids, Mich. It is designed to house the company's executive and general office staff. In addition to providing more manufacturing space at the Grand Rapids plant, this new office location will facilitate service to the company's eight plants under the decentralization program which was inaugurated in 1954.

The executive offices and Industrial Relations and sales offices will be located on the second floor. The first floor will be occupied by the General Accounting, Purchasing and Traffic Departments. A lunch room, record storage and mechanical facilities will be located in the basement.

Construction is expected to start around April 1 and completion is contemplated approximately December 1 this year.

Syracuse P&P Alumni Luncheon February 22

Pulp and Paper Alumni of Syracuse College of Forestry will hold their 22nd Annual TAPPI week Luncheon at the Biltmore Hotel in New York City at 12:00 noon on February 22.

The Class of '31 will be honored for their twenty-fifth anniversary. Officials of the State University of New York, the College of Forestry and Syracuse University will outline developments during the last year and plans for the future. Representatives of the College and University Alumni associations will speak briefly on their activities.

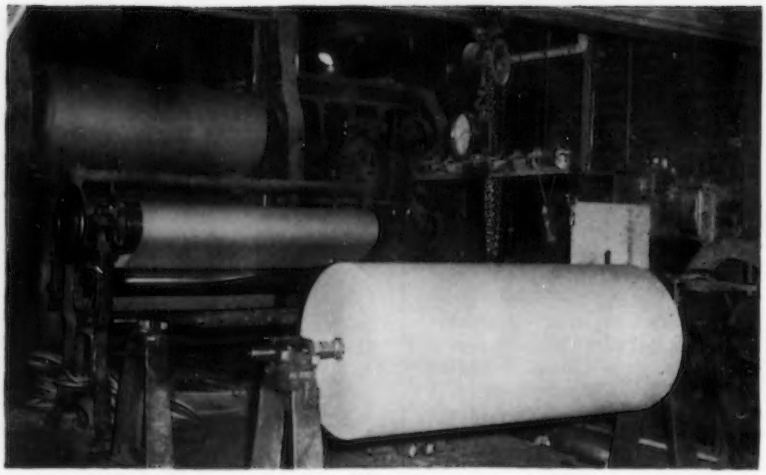
Arrangements for the luncheon are being made by Professor F. W. O'Neil of the College Pulp and Paper Department, Lon Sutherland of the Class of '31, J. P. Casey, Secretary-Treasurer, J. J. Schwenkler, Vice President and L. K. Burnett, President of the Syracuse Pulp and Paper Alumni Assn.

Lost Ring Turns Up in Waste Paper Pile

Ralph DeRita, a Detroit shoe salesman, has his gold garnet ring back thanks to an alert paper mill employe who found it in tons of scrap paper.

Charles Samalot, an employe of the American Box Board Co. at Grand Rapids, Mich., found the ring while working in the company's mill and turned it over to the personnel department which checked with the many firms that ship scrap paper to the mill.

They finally located Mr. DeRita who said the ring apparently fell off his hand and dropped into a shoe box while he was fitting a shoe on a customer.



Addition of radiant gas burners to this machine speeded-up production 20 percent.

How Pabco Speeds Drying with Gas Burners

Arthur Q. Smith
American Gas Assn., New York, N. Y.

The application of auxiliary gas heat to existing paper machine dryers is the simplest way to increase drying speed. This type of heat aplicaption has proven very successful at the Emeryville, California, plant of Pabco Products, Inc. This plant makes building papers for roofing, linoleum backing, etc. on a typical one cylinder machine with conventional steam dryers.

There are two methods of increasing drying speed. One is to add additional steam drums which involves a large capital outlay and in many instances is impracticable because of plant space limitations. The other method is to install radiant gas burners on the first set of drums the web passes over. This can be done at a minimum of expense. The cost of fuel for operating them amounts to very little, no additional labor is required and maintenance is negligible.

High Efficiency

Here at Pabco, to speed the drying operation, Red-Ray radiant gas burners were installed on two dryers at the wet end. By applying intense heat directly to the outer surface of the material where evaporation actually takes place, the heat is utilized in the process of evaporation and the surface temperature remains below the boiling point.

The efficiency is high because, in addition to the radiant heat from these high temperature burners, (in the range of 2,500°F.) heat is available in the form of heated air and hot products of combustion.

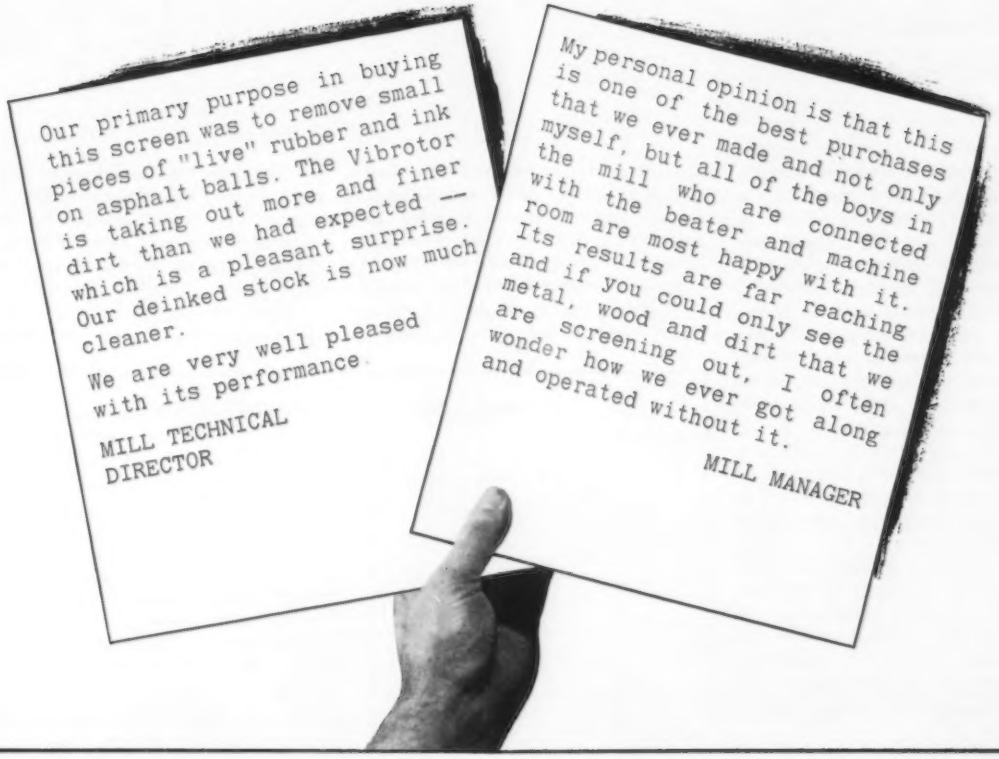
As the radiant burners remove considerable water by evaporation and heat the web to approximately boiling temperature, drying starts immediately the web comes into contact with the subsequent steam drums. Because of the combination of radiant and steam drying, production on this particular machine has been increased 15 to 20 per cent.

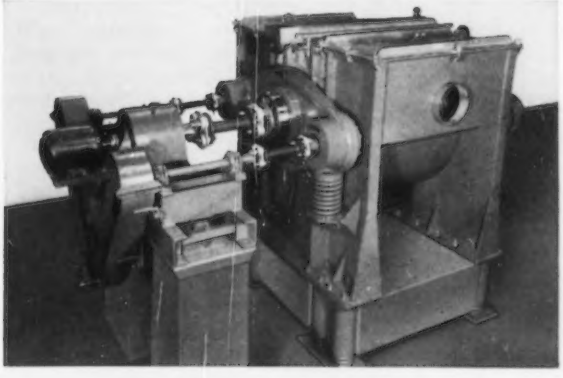
Completely Automatic

One of the features of this installation are the completely automatic devices so interlocked that in case of any failure along the line, everything fails "safe." There are flame rods on the pilot lights, air and gas pressure switches are wired in series with the main gas valve to shut burners off in the event of air or gas supply failure. Other safety devices are a centrifugal speed switch which operates if the machine slows down below a safe minimum speed. A photo electric switch is also installed in case the paper web breaks. If this happens, gas is shut off immediately.

You'll Share These Opinions When You Install

BIRD VIBROTOR SCREENS


Our primary purpose in buying this screen was to remove small pieces of "live" rubber and ink on asphalt balls. The Vibrotor is taking out more and finer dirt than we had expected — which is a pleasant surprise. Our deinked stock is now much cleaner.
We are very well pleased with its performance.
MILL TECHNICAL DIRECTOR
My personal opinion is that this is one of the best purchases that we ever made and not only myself, but all of the boys in the mill who are connected with the beater and machine room are most happy with it. Its results are far reaching and if you could only see the metal, wood and dirt that we are screening out, I often wonder how we ever got along and operated without it.
MILL MANAGER



Bird Vibrotor Screens are in operation on bleached, unbleached, semi-chemical, high density, dissolving pulps, deinked and other stocks. They deliver big tonnages, handle high consistencies, take up minimum space, call for minimum maintenance.

Ask us to tell you just what the Bird Vibrotor Screen can do for you.

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • DECATUR (Atlanta), GEORGIA

How You Can Reduce Defective Paper Production

George Fredericks
Quality Control Consultant

It is within the province of the general superintendent of a paper mill to know the level of defective production both on a long term and a short term basis within his department.

This paper will concern itself with exploring this essential area of knowledge for a top superintendent. Within this paper will be explained a method for establishing whether the amount of defective production on a daily basis has exceeded its normal bounds. In addition, it will help establish an efficient reporting system from which you will be able to tell which defects to beware of on future runs based upon information from past performance.

To define defective production, let us agree that it is any paper off the machine which cannot be classified as top quality production. This defective production is such that it will require an additional operation besides finishing before it can be saleable or that it will be cut to broke.

Short Term Barometer

The short term barometer of defective production is simply based upon the principle that what has happened during the past 30 days should repeat itself during the next 30 days, *within the limits of chance variation unless conditions have changed radically.*

If some additional variable such as a worn felt enters the picture, the amount of defective production for the day in question might suddenly exceed the normal bounds (the limits of chance variation). When this occurs, it is an alarm signalling a change which calls for immediate trouble shooting.

To develop such a barometer is a relatively simple task. Initially, we need to determine what is the normal percent of our production from Machine X which is defective. For this, an efficient reporting system is required.

The finishing department processes all paper off the machine prior to shipment. Wherever and whenever the finishing department encounters defective paper, and they are forced to make separate classification for rework or broke. They must weigh this paper and record the information noting the run for which this paper is defective. The finishing department should furnish the general superintendent with a daily report, Figure 1, which gives the total weight produced and the total defective production. In addition this report should be supplemented with a more detailed breakdown, Figure 2, giving the reasons and weights of defective production by grade.

If we were to list for a period of 30 days, a calendar month, the percent of

TABLE I—CALCULATION OF CONTROL LIMITS

Day	I Percent Defective of Total Production		II Group Difference Between High and Low	
April 1	4.3			
2	2.8	Low		
3	2.8		6.9	Group I
4	9.7	High		
5	9.3			
6	4.2			
7	5.1			
8	3.0		4.4	Group II
9	5.8	High		
10	1.4	Low.		
11	3.1			
12	3.5	High		
13	0.3	Low	3.2	Group III
14	3.5			
15	2.3			
16	4.0	High		
17	1.2			
18	1.3		3.7	Group IV
19	0.7			
20	0.3	Low		
21	1.0	Low		
22	2.8			
23	10.0	High	9.0	Group V
24	2.2			
25	6.0			
26	1.3			
27	0.2	Low		
28	6.0		8.0	Group VI
29	8.2	High		
30	3.7			
Totals	110.0		35.2	

Average Percent Defective

$$\frac{\text{Total}}{30} = \frac{110.0}{30} = 3.7\%$$

Upper Limit

$3.7\% + (5.87 \times .70) =$
$3.7\% + 4.1\% = 7.8\%$

Average Difference Between High and Low

$$\frac{\text{Total}}{6} = \frac{35.2}{6} = 5.87$$

Lower Limit

$3.7\% - 4.1\% = 0\%$*

* Cannot be less than 0 as there cannot be less than no percent defective.

each day's production which was defective, we have sufficient information to establish control and maintain the same level of defective production for the next month.

To establish a chart (See below) which will serve as the barometer of defective production, we must determine the average daily per cent defective and the normal bounds about it.

The method of computing this is as follows: (See Table I for an example)

1. a. Add the per cents defective for the 30 days involved.
   b. Then dvide by 30 to obtain the average daily per cent defective.
2. a. Group the 30 days in blocks of five as follows:

Group	I	II	III	IV
Days	1-5	6-10	11-15	16-20
	V		VI	
	21-25		26-30	

   b. Then for each group, determine the difference between the highest and lowest per cent. You will have six such differences, one for each group of five days.
   c. Add these six differences and divide by six to obtain the average difference.
   d. Multiply the average differences by .70.
   e. Add the value obtained in (d) to the average. This is the normal upper limit of the daily per cent defective. (Upper control limit).
   f. Subtract the value obtained in (d) from the average. This is the normal minimum limit of the daily per cent defective (Lower control limit).

To explain, if the average per cent defective does not change, all daily per cents defective from then on will be between the upper and lower control limits computed above. These are the limits of chance variation. If any day's per cent defective production exceeds the upper control limit, the odds are 95 out of 100 that something has happened to cause more defective production. It wil lbe necessary to find out the cause. If, on the other hand, the per cent defective for a given day is below the lower control limit, it is an excellent idea to troubleshoot to determine what change has been made to cause less defective production. This can lead to definite improvement. The author is familiar with a mill where in a period of six months the per cent defective was halved through the use of techniques such as this.

It may be deemed useful to prepare this information on a graph and place it at or near the machine involved so that machine personnel can tell at a glance how they are doing as compared to the day or month before. Figure 3 shows a sample chart of this type. In multiple machine mills, these charts can be used as a morale stimulant in starting competition between machine crews as to which machine can produce proportionally less defective paper.

However, to be of any value, these charts must be kept current and wherever possible, explanations of excessive per cent defective posted right on the chart. New control limits should be established every month. To do this use the past month and compute as shown in Table I. It is also a good idea to place the new control chart adjacent to the old one. In this way it is possible to make a visual comparison of the two months.

Long Term Barometer

The supplementary report furnished by the Finishing Department (Figure 2) can provide a substantial amount of information on a long term basis. A monthly tabulation of the defective production due to each defect can act as a guide to the machine conditions which are causing the greatest trouble.

In addition files kept by grade can be used as a reference prior to starting up on that grade. In this way, an insight into the difficulties to be expected might be gained.

This application of statistical principles to your production records can tell you immediately when something abnormal has occurred so it can be corrected before causing a great deal of difficulty. It is not to be construed that the technique outlined in this paper can by *itself* reduce your defective production, but it can provide an excellent indication as to when to troubleshoot specific days, machines, or grades. The reporting system will pinpoint causes of broke for the particular grade for each day. Finally, the short term barometer can have a morale boosting effect by giving a graphic presentation of loss for responsible personnel to see and understand.

FIGURE 1—DEFECTIVE PRODUCTION REPORT

Machine ..... Grade ..... Date .....

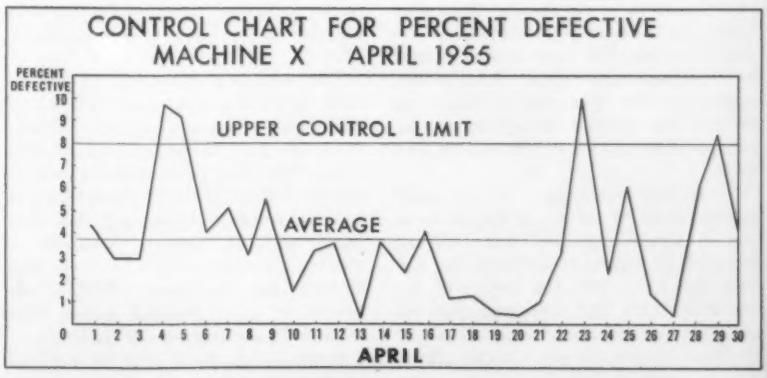
Defect	Loss	Disposition
Calender Cuts		
Cockles		
Crush Marks		
Foam Spots		
Poor Folding Strength		
Poor Mullen		
Off Weight		
Off Caliper		

FIGURE 2—PRODUCTION SUMMARY

Date ..... Machine .....

	Pounds	Percent
Defective Production		
Trim Broke		
Good Production		
TOTALS		

Comments:



Sulphite Waste Liquor In Cement Manufacture

E. Langins and H. Snow

Bowater's Newfoundland Pulp and Paper Mills Ltd., Corner Brook, Newfoundland

A commercial trial indicated that S.W.L. increased milling capacity, reduced fuel consumption, increased production and improved quality.

The desirability of finding means of utilizing sulphite waste liquor has stimulated many inventive minds, as a search through the patent literature will reveal (1). Many applications have been found including the use of spent sulphite liquor materials in plastics, in vanillin production, in foundries as a core binder, as a road surfacing material, as a tanning agent, as fuel, as adhesives and as dispersing agents, but most of them suffer from the disadvantage of requiring costly processing of the liquor before use.

Our aim in this work was to find means of utilizing some of our sulphite waste liquor and the proximity of a cement plant suggested a study of the properties of sulphite waste liquor which might make it useful in cement manufacturing.

Previous Work

A survey of the literature revealed that one product of sulphite waste liquor, namely calcium lignosulphonate, had been found to be a specific dispersing agent for a suspension of Portland cement in water. The process was studied by Ernsberger and France (2) who concluded that the mechanism of dispersion involves the positive adsorption of ligno sulphonate anions by the cement particles.

In another publication (3) the same authors show by studies of the dissociation of lignosulphonates, that although the acid is highly dissociated, the calcium salt has a very low degree of dissociation. This indicates that the adsorption of lignosulphonate ions by Portland cement is due to the affinity of the ions for cations on the surface of the cement particles.

Scripture (4) has reported studies of the physical-chemical and colloidal properties of calcium lignosulphonate which might be expected to be related to its behavior as a cement dispersing agent. He shows that the amount of lignosulphonate adsorbed by cement increase with increasing molecular weight which in turn depends on the conditions of production of the lignosulphonate.

Adsorption of lignosulphonate anions by cement particles results in the particle bearing a negative charge, the existence of which is confirmed by the observation that, whereas cement particles suspended in distilled water show no tendency to migrate towards either electrode in an electric field, when suspended in a calcium lignosulphonate solution, they migrate towards the anode. This electric charge causes the cement particles to repel each other, that is, it aids in dispersing the particles. The amount of dispersion can be determined for experimental purposes by determining the surface area with turbidimeter (2).

The increased dispersion of the cement particles causes water trapped inside clusters of particles to be released to become part of the liquid phase. This means that for a given water-cement ratio, the volume of liquid permitting particle movement is larger and this, combined with the easier movement of smaller particles results in increased fluidity. For the same fluidity, the amount of water required is less when calcium lignosulphonate is added.

Scripture has studied the value of calcium lignosulphonate derived from sulphite waste liquor as an additive to cement and workers at the Bowater's Central Research Laboratories in England (unpublished report) have compared the benefits to be obtained from using fermented and unfermented sulphite waste liquor and straw liguor, sodium carbonate, sodium pyrophosphate, straw lignin and some commercially available lignin dispersants. The former has suggested the use of purified calcium lignosulphonate and the latter have recommended the use of lignin from straw liquor. Both have reported that sugar in the cement will have a retarding effect on its hydration reactions and must therefore be removed from the sulphite liquor or its products before addition to cement. A considerable portion of these sugars could be removed by fermentation but this would probably be uneconomical considering the small volumes of liquor involved. Furthermore, the Central Research Laboratory report states that, whereas untreated sulphite liquor produces a very great lowering of the viscosity of cement suspensions, this lowering is not maintained when the liquor is freed from sugars. This must be reconciled with the statement by Scripture (4) that removal of carbohydrate impurities, especially sugars, is beneficial to the cement-dispersing properties of unpurified calcium lignosulphonate.

We can summarize by saying that attraction of lignosulphonate ions by cations on the surface of cement particles causes absorption of the negative ions. The resulting negative charge causes dispersion of the cement particles

and increased fluidity of the cement suspension. Impurities such as sugars will affect the hydration reactions of the cement.

Cement Manufacturing

The next step was to study the steps in cement manufacturing where spent sulphite liquor addition might be advantageous. A brief description of the cement manufacturing process follows, based on the flowsheet Figure 1.

The raw materials used are shale, low magnesium content limestone, and gypsum. The limestone and shale are crushed during alternate periods in the crusher (1) and carried by conveyor belts (2) to the hoppers (3) from which they are fed to the grinder (4) at a controlled rate in proportions determined by chemical analysis of the raw materials. Water is also passed into the grinder in sufficient amounts for the ground slurry to flow through. After grinding a small additional amount of water is added to permit the slurry to be pumped to the silo (5) for storage. Forced circulation is maintained in the silo by circulating pumps and with compressed air.

From the silo the slurry is pumped to a feed tank which feeds the slurry through jets into a rotating container (6) filled with tumbling, especially shaped pieces of iron. This apparatus is known as a calcinator and into it is drawn hot air from the kiln (7). Much water is evaporated and the thickened slurry forms into granules. The granules are separated from dust by the force of the air drawn through the kiln by the fan (8) which blows dust and flue gases through the cyclone dust separator (9). The flue gases pass up the stack and the dust particles are granulated by passing into the regranulator (10) and mixing with sufficient water to cause formation of granules.

The granules are then passed into the kiln (7) which is heated by internal combustion of fuel oil fed in at the opposite end. Air for combustion is drawn in by the fan (8) and also serves to remove dust through the dust separator (9). As the granules pass through the sloping, rotating kiln by the action of gravity, they become progressively hotter and hotter and evaporation of water is completed and the reactions take place which convert the granules to cement clinkers. These clinkers are stored until the cement is needed, at which time they are ground with a small amount of gypsum to control the setting rate in a grinder similar to that already mentioned.

Use of Sulphite Waste Liquor

The low degree of dissociation of calcium lignosulphonate and therefore the great affinity of lignosulphonate ions for calcium ions on the surface of the cement particles, was explained previously as being the cause of the dispersing effect of lignosulphonate on a cement suspension. It could reasonably be expected that calcium carbonate particles would similarly absorb lignosulphonate ions and that the fluidity of a calcium carbonate or limestone suspension might be increased by addition of calcium lignosulphonate or sulphite waste liquor. The only literature found concerning the problem was a patent (5) issued in December 1945 dealing with a method of reducing the water content of mineral slurries without increasing their viscosity by incorporating in them such materials as a metallic salt of lignosulphonic acid.

We would therefore expect that addition of waste liquor would permit a reduction in the amount of water added to the slurry mill without decreasing the fluidity so that the slurry could still be pumped to the silos. At the same time we would expect the dispersing effect of the lignosulphonate to increase the grinding efficiency by dispersing clumps of particles and by opposing the reagglomeration of particles.

Concentrated sulphite waste liquor is

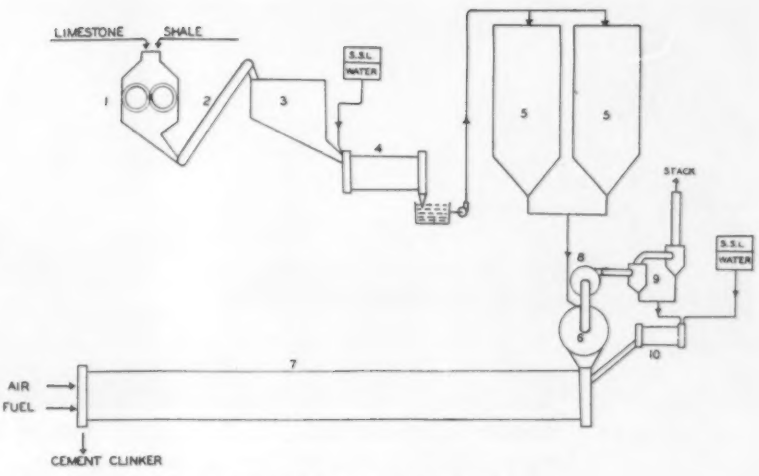


FIGURE 1—CEMENT MANUFACTURE—FLOWSHEET

TABLE I—ANALYSIS OF SPENT SULPHITE LIQUOR

Sample No. 1		April Average
1. Specific gravity at 20°C	—	1.048
2. pH	—	2.7
3. Total solids g/100 ml	—	11.9
4. Total sugars g/100 ml	—	3.17
Sample No. 2		**May Average**
1. Specific gravity at 20°C	—	1.049
2. pH	—	2.42
3. Total solids g/100 ml	—	12.0
4. Total sugars g/100 ml	—	3.18
5. Sulphated ashes g/100 ml	—	1.76
6. Organic substances g/100 ml	—	10.50
7. CaO g/100 ml	—	0.62
8. MgO g/100 ml	—	0.04
9. Na_2O g/100 ml	—	0.06
10. Total sulphur g/100	—	0.79
11. SO_3 g/100 ml	—	0.48
12. Free SO_2 g/100 ml	—	0.07
13. Loosely combined g/100 ml	—	0.49
14. Sulphone g/100 ml	—	0.62
15. Ligno Sulphonic acids g/100 ml	—	4.82
16. Calorific value—Bone Dry Basis	—	8107 B.T.U./lb.
Sample No. 2	**Fermented**	
1. pH	—	5.0
2. Total solids g/100 ml	—	11.7
3. Total sugars g/100 ml	—	0.91
Sample No. 2	**Neutralized**	
1. pH	—	5.2
2. Total solids g/100 ml	—	11.6

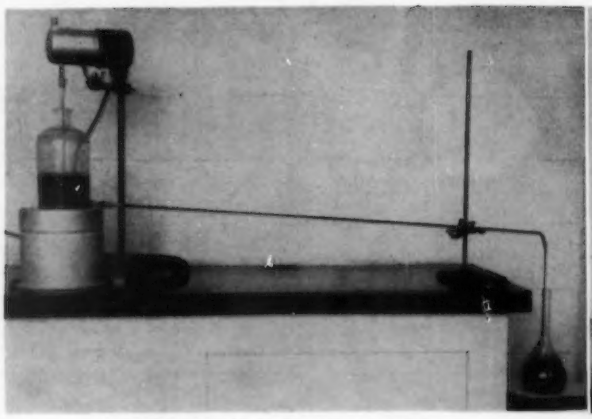


FIGURE 2—VISCOSITY APPARATUS

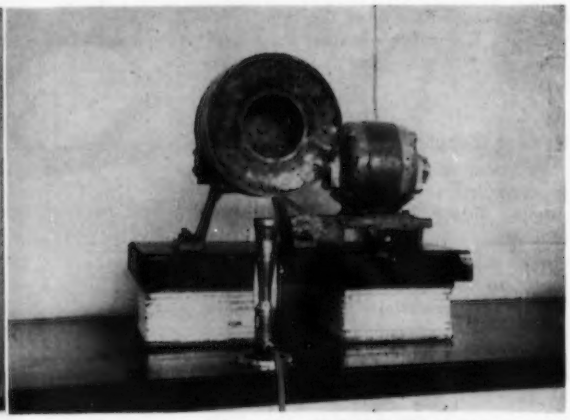


FIGURE 3—GRANULATION APPARATUS

an effective bonding agent and we can expect that the liquor addition will lead to better granulation in the granulator and less dusting in the kiln.

It was decided that experimental work of a preliminary nature should be carried out in the laboratory to verify these suspected effects as a prelude to a mill scale trial.

Subsequent to the experimental work and mill trial described in this report, a Russian publication was found in which the effect of electrolytes, peat extract and sulphite waste liquor on the fluidity of a suspension of raw materials for cement manufacturing was discussed and possible benefits to grinding and pumping described (6).

Experimental Work

Two separate composite samples of sulphite liquor were used for these experiments collected from the digesters over a period of two months. These are referred to as sulphite waste liquor samples No. 1 and sample No. 2, and analysis according to TAPPI standard methods (7) is given in Table I. Samples of neutralized liquor, fermented liquor and concentrated liquor were also prepared for viscosity experiments with the solids and sugars contents shown in the table. The concentrated liquor contained approximately 60 per cent solids.

TABLE II—GRINDING STUDIES

SLURRY CONSISTENCY:
35% Water, 65% Minerals

MINERAL COMPOSITION:
16% Shale, 84% Limestone

Grinding Time	Percent Minerals Retained on 100 Mesh Screen	
	No Sulphite Liquor Added	0.3% Spent Sulphite Liquor Added
Hrs.	%	%
1/2	66	73
1	64	38
1 1/2	33	24
5	16	6
15	12	7

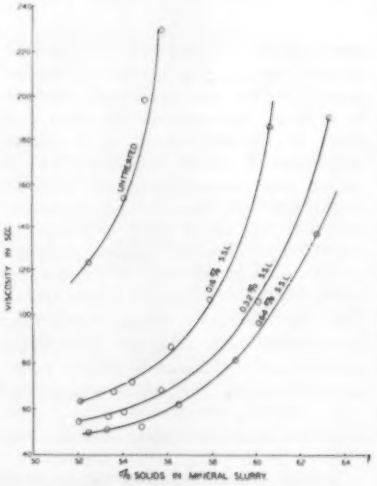


FIGURE 4—Viscosity vs. Solids Content of Mineral Slurry.

The amounts of liquor added are reported in terms of the percentage ratio between the solid content of the liquor added and the solid content of the slurry.

For the grinding studies, fractions of limestone and shale passing No. 4 sieve and retained on No. 16 sieve were prepared. These were mixed with water in the proportions given in Table II. Two small Abbe pebble mills were used for the grinding experiments. Each charge of minerals and water was ground for a given time after which the pebbles were removed and the percentage of dry material remaining on 100 mesh screen determined.

The results of the grinding tests are given in Table II. They show that addition of spent liquor is beneficial. By causing the particles to be charged, lignosulphonate opposes reagglomeration of the finer particles. This should also be found in the mill grinders.

In the commercial process, water is added to the ground slurry until it can be pumped to the silos without too much difficulty. This water must be subsequently evaporated and the evaporation of water requires fuel, therefore, a decrease in the water content of the slurry pumped to the silo means a saving of fuel in the kiln.

To determine the effect of spent liquor or fluidity, the apparatus pictured in Figure 2 was used. The viscosity is reported in terms of the time required for 1000 ml of slurry to pass through the tube, commencing with the same head in the glass vessel for each measurement.

Slurry samples were obtained and experiments carried out to determine the variation of viscosity with solids

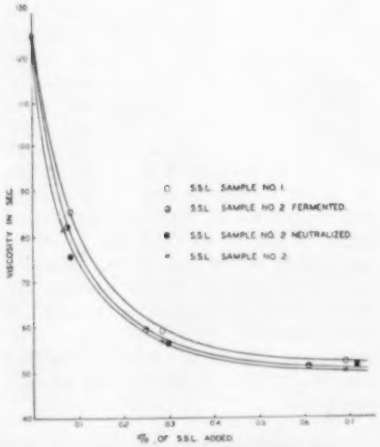


FIGURE 5—Viscosity vs. Percent S.S.L. added to Mineral Slurry.

content and with varying amounts of spent liquor. The results given in Figures 4 and 5 show viscosity to rise rapidly with increasing solids content of the mineral slurry and to decrease, rapidly at first, with increasing amounts of spent liquor. Figure 4 shows that the higher the viscosity, the greater is the reduction produced by increasing the amount of spent liquor present.

Figure 5 shows the effect produced by adding neutralized, fermented, and untreated sulphite liquor. Within the limits of experimental error these curves are the same. A curve was also prepared using evaporated liquor and was found to be identical to the others. These results have been verified by repeating the experiment with different samples of slurry and spent liquor. The viscosity lowering produced by waste liquor sample No 1. was found to be somewhat less than with sample No. 2 which had a higher sugar and solids content. This would indicate that sample No. 2 contained a greater proportion of more highly polymerized lignosulphonates which would be more readily adsorbed.

From these viscosity tests we can conclude that addition of sulphite waste liquor before the mill grinder should permit an increase in the solids content of the slurry without making it too thick to pump.

From the grinder the slurry is pumped to the silos where settling must be prevented until the mixture can be fed to the calcinator. To determine the effect on settling, slurry at 53 per cent solids was placed in 1000 ml. graduates and to one, spent sulphite liquor was added. The amount of sulphite spent liquor added was one per cent based on dry solids. At intervals the volume of supernatent liquid was read and recorded as shown in Table III. These results show that sulphite spent liquor has an unfavourable influence on the settling rate and therefore care must be taken to maintain thorough mixing.

Granulation experiments were carried out by placing slurry in the apparatus pictured in Figure 3, rotating at constant speed and heating with a Meker burner. After a given number of revolutions, the granules were classified and the dry weights of the fractions obtained. The results are given in Table IV which shows that the binding qualities of spent liquor have increased the size of the granules.

The granules are also stronger as shown in Table V and in the photographs of Figure 6 obtained by dropping granules of similar size from a fixed height onto a blackened surface.

These laboratory experiments indicate that in the industrial process improved efficiency of the calcinator can be expected.

TABLE III—SEDIMENTATION OF MINERAL SLURRY

Settling Time Hrs.	Slurry Untreated Ml.	Volume of Clear Liquid 1% S.W.L. Added to Slurry Ml.
1	4	7
2.5	13	17
3.5	20	26
4	24	35
5	30	46
6.5	36	60
22	81	123

The laboratory tests described thus far indicated that in the industrial process the following effects may be expected as a result of addition of small quantities of spent sulphite liquor; increased fineness of the slurry from the grinder or increased capacity at the same fineness; sufficient fluidity of the slurry to permit pumping to the silos adding approximately nine per cent less water; improved granulation and granule strength, therefore less dust formation in the kiln; a small saving of fuel in the kiln due to heat liberated by combustion of materials in the spent sulphite liquor added; and finally, the lower percentage of water in the material to the calcinator should permit a decrease in fuel consumption at the same production level or an increase in production with the same fuel consumption. The quality of the cement produced would remain unaffected.

These results were sufficiently promising to warrant a mill scale trial at the cement manufacturing plant.

Mill Trial

Sufficient spent sulphite liquor for a mill trial was obtained at 9.38 g./100 ml. a total sugar content of 2.66 g./100 ml. This was fed with limestone and shale to the slurry mill at such a rate that the average concentration of spent liquor solids was 0.66 per cent based on the mineral solids.

Normally, the water content of the slurry must be kept up to 33-35 per cent to pump it to the silos but during the addition of spent liquor it was found possible to pump the slurry when the water content was reduced to 26-28 per cent. This was accomplished by increasing the solids feed and decreasing the amount of water supplied so that the throughput of solids was increased by approximately fourteen per cent.

Unfortunately, plugging of the weightometers feeding the limestone and shale to the grinder sometimes occurred while water addition was uninterrupted. As a result the average water content for the period was thirty-six per cent. At all times the fineness of the ground minerals was good with an average retention of 4-5 per cent on a screen with 4,900 meshes per square centimeter.

This slurry was stored in a silo and fed to the calcinator and the kiln during a twenty-two hour period. The amount of dust separated was 66.4 kg./min. with a water content of 19.0 per cent, and the clinker production rate was 280 tons per day. This production rate was, at that time, the highest achieved since the cement plant had been in operation and was presumably due to the presence of the sulphite liquor.

When operating without sulphite liquor addition to the slurry, mill, dust production was estimated at 42 kg./min. with a moisture content of 14.5 per cent and a production rate of 245-250 tons per day. Comparing the amounts of dust produced as percentages of the clinker production and comparing on a bone dry basis, we get dust production without sulphite liquor addition equal to 21 per cent of clinker production, and dust production with sulphite liquor addition equal to 28 per cent of the clinker production. However, the dust collectors were not operating properly at this time and only one measurement was made.

With regard to granule strength, samples were taken at two different points along the kiln and classified on U. S. Standard Sleeves. The results are printed in Table VI. This test is designed to show the disintegration of granules passing through the kiln and the results show that the change in the dust amounts between holes 1 and 2 is more favourable when the slurry contains spent liquor.

TABLE IV—SIEVE ANALYSIS OF GRANULATED MINERAL SLURRY

Sieve No.	Untreated	0.3% S.S.L. Added	0.6% S.S.L. Added	1.0% S.S.L. Added
Retained on No. 4	73.0%	88.6%	96.9%	96.5%
Passes No. 4; Retained on No. 60	2.9%	8.9%	2.7%	3.0%
Passing No. 60 Retained on No. 100	0.6%	0.2%	0.1%	0.1%
Passing No. 100	23.5%	2.3%	0.3%	0.4%

FIGURE 6—GRANULAR STRENGTH

(a) No S.S.L. Added (b) 0.5% S.S.L. Added (c) 1.0% S.S.L. Added

A more direct determination of granule strength was made by determining the minimum breaking height and the manner of breaking of these granules. These tests showed that the breaking height of granules containing sulphite liquor varied from 6 to 12 inches and that of granules containing no sulphite liquor varied between 4 and 8 inches. Also the former granules broke with the formation of much less dust than is formed by breaking granules with no sulclearly the improvement in granule phite liquor present. These tests show strength due to addition of sulphite liquor.

This mill trial was intended to show what equipment would be necessary for an extended mill trial, what effects could be expected and what tests would be necessary to determine these effects. It was hoped that the plant would then be operated for a fourteen day period with addition of spent sulphite liquor but, unfortunately, changes in our blowpit room have made it impractical to conduct such an operation at this time.

TABLE V—GRANULAR STRENGTH

Mineral Slurry	Granule Breaking Hgt. in Ins. Ave. of 25 Gran.	% of Granules Broken at 22 Inches Falling Ht.
1. Untreated	20	50
2. 0.3% S.S.L. Added ..	24	50
3. 0.6% S.S.L. Added ..	24	30
4. 1.0% S.S.L. Added ..	30	10

TABLE VI—CLASSIFICATION OF MATERIAL SAMPLED FROM KILN

Sieve No.	Hole No. 1 Without S.S.L.	Hole No. 1 With S.S.L.	Hole No.2 Without S.S.L.	Hole No. 2 With S.S.L.
Retained on 3/8" Mesh	24.75%	12.3%	10.2%	7.9%
Retained 4 Mesh	25.9 3/8	11.55%	12.6%	16.3%
Retained 14 Mesh	20.65%	15.0%	11.05%	27.3%
Retained 28 Mesh	1.8%	3.7%	4.6%	5.45%
Retained 60 Mesh	1.05%	3.95%	4.55%	4.65 3/8
Retained 100 Mesh	0.6%	2.0%	3.0%	1.95%
Passing 100 Mesh	25.25%	51.5%	54.0%	36.45%

Acknowledgments

We wish to acknowledge our appreciation of the kindness of the North Star Cement Co. which supplied samples of limestone, shale, ground slurry and cement and which cooperated so fully in the conduction of the mill trial at their plant. We wish also to thank Dr. Aichinger, chief chemist, Maig Co., and the late K. Linde, former chief chemist, North Star Cement Co., for their many useful suggestions.

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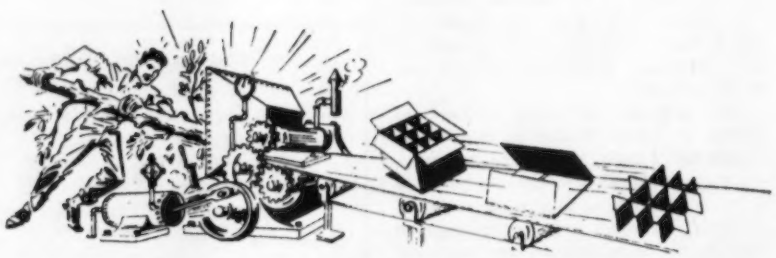

This illustration appears on the letterhead of Roy Mercado & Co., S.A., of Mexico City, Mexico.

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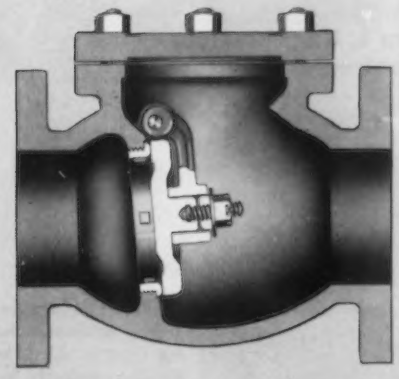
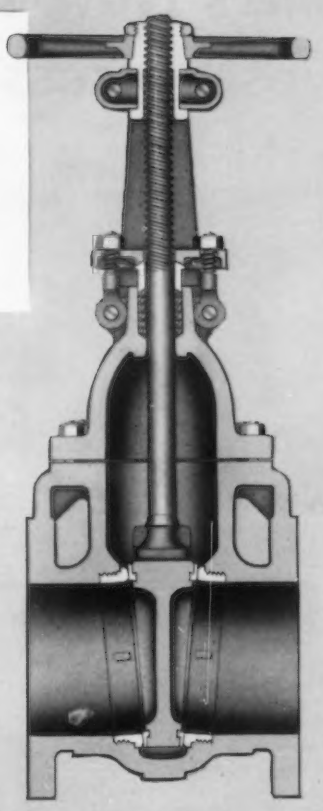


Cross section, Check, No. 14493
Flanged ends



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Ozalid's New Triplex Coating Machine Proves Success of Unusual Design

John W. Brusil,
Project Engineer

Motron L. Kaganowich,
Plant Engineer

OZALID, Div. General Aniline & Film Corp.
Johnson City, N. Y.

Paper sales of Ozalid Division of General Aniline & Film Corporation have been rising steadily. Management, looking ahead, decided that coating facilities would become inadequate in the foreseeable future, so a project was launched in 1952 to design, build and install a new paper coating machine to coat diazo papers.

The machine was to be designed to handle any of the Ozalid papers from 16 lb. to 56 lb. stock (17 x 22—500 sheets). It became necessary to provide three coating stations because of the particular coating requirements of some products. It was to be a continuous, high production machine — hence a flying splice unwind and flying transfer winder would be necessary.

Design problems

Because it was necessary to coat the back of the paper, then put two coatings on the face side, the configuration of the machine became either a very high or a very long unit. To combat edge curl, the dryers must assume an arch shape, further complicating machine design.

The problem of housing such a coating machine was solved in conjunction with the machine design. If the machine could be made low and long, it could be accommodated in an existing coating room. This was also attractive from supervisory and supply considerations. While the coating room required extensive alterations, such alterations were far less expensive than if a separate building were erected.

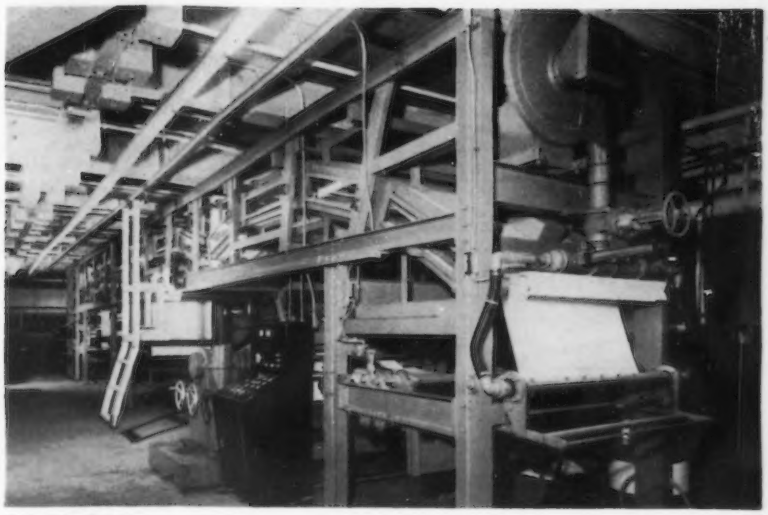
The limitation in height and length of the room caused serious consideration of electric radiant heat for drying. Several years of experience using radiant heat for booster drying applications had been very successful. A considerable number of tests were made on a larger scale, all of which pointed to being able to use electric radiant heaters as the drying medium. However, use of such heaters made it necessary to plan a retraction mechanism, to avoid scorching or setting fire to the web while the machine was at rest. Three retraction methods were tested and the side slide arrangement was selected as best for this machine. Experience had shown that a 35-40% thermal-electric efficiency could be expected of the dryer arrangement and the new dryer was designed accordingly. The result was that the coater could be accommodated in the existing building.

The triplex coating machine to fill these requirements was designed and built by the Frank W. Egan Company to Ozalid specifications. The machine is exactly what its name implies, a three-station machine for back-wet, base-coat and sensitizer coating of 44″ wide paper.

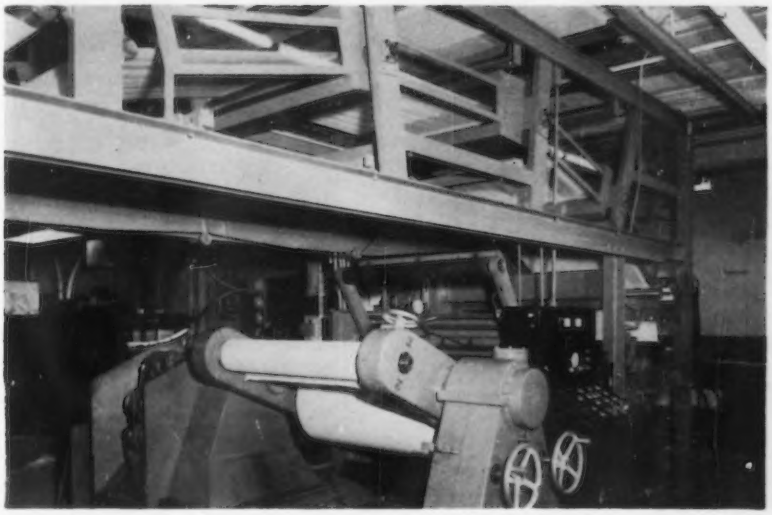
In general, it comprises an automatic unwind unit of the constant tension, automatic splicing type; three coating stations with air knife doctoring; three enclosed, retractable drying ovens with Chromalox far-infrared radiant panels; a cooling and heating calender stack, and an automatic, constant tension, splicing type winder. The machine is driven by a completely coordinated Reliance V*S Drive.

Automatic unwind

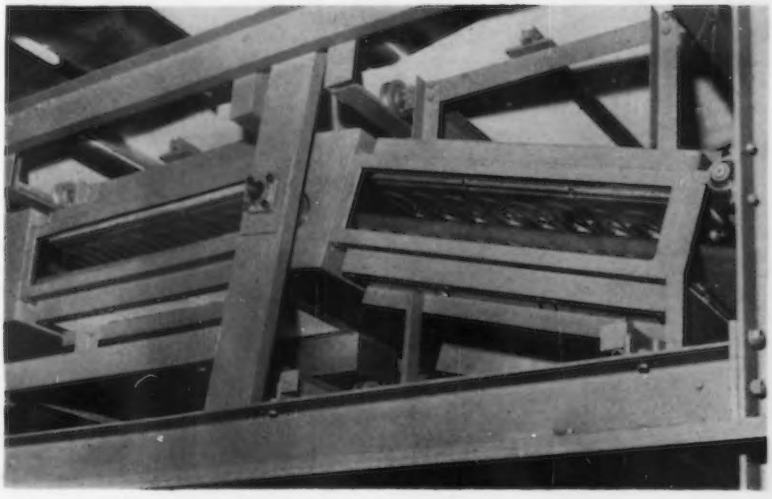
The automatic unwind unit accommodates rolls up to 38″ diameter on 3½″ diameter Tidland pneumatic shafts; the roll widths range from 24″ to 44″. The design of this unit provides two Worthington Variable Speed Drives, one for each unwind shaft, and a dancer roll to control and maintain a constant tension in the web. The dancer roll movement is mechanically translated into a short stroke reactor which controls the electrical elements that keep the unwind motors in step, so that the web tension remains constant throughout the run of the roll. The unwind unit also incorporates two flying splice mechanisms, one for paper wound felt side in, the other for paper wound felt side out. An operator's unwind control panel is provided, which is equipped with start and stop push-buttons for each of the two unwind shafts; with "Run," "Thread," "Stop," and "Emergency Stop" push-buttons for the main machine drive; with control levers for actuating the mechanism for synchronizing the speed of the in-coming roll with line speed; and with control levers for operating the web cut-off knives.



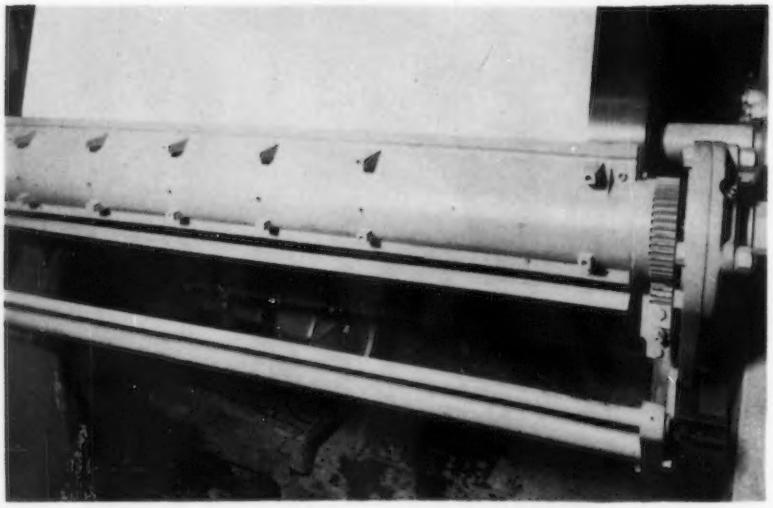
OZALID'S TRIPLEX COATING MACHINE in full length view from backwet coating station end. Traveling ladder is used for drier threading. Heaters are in drying position. Console contains unwind stand controls.



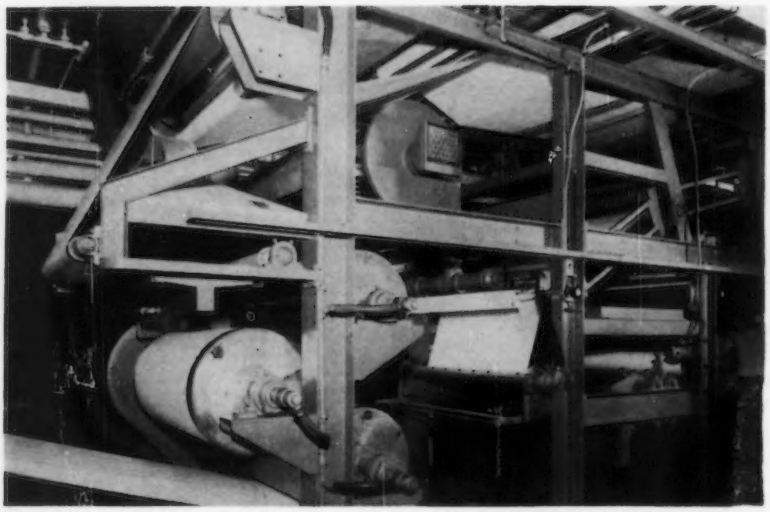
FROM THE UNWIND stand paper travels into backwet coating station at front of machine. Backwet drying oven appears at top, with radiant heaters retracted.



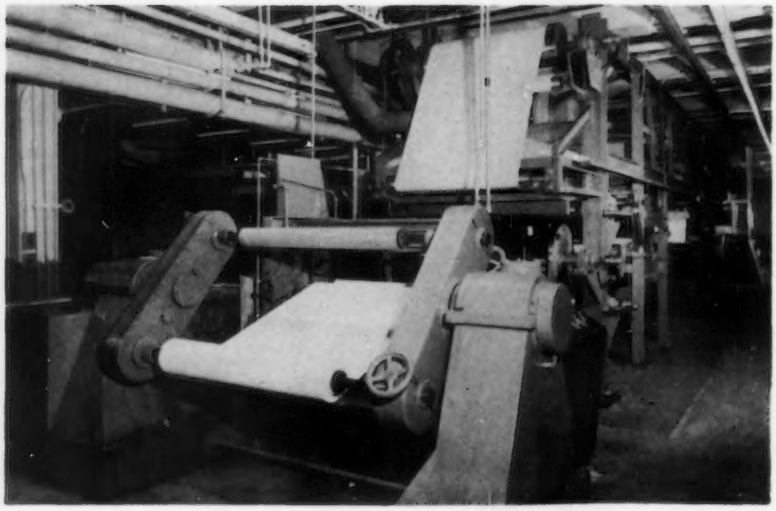
CLOSE-UP of one drying oven with web in place and heaters in drying position. Motorized retraction of the heaters is facilitated by roller suspension of the units.



CLOSE-UP OF AIR KNIFE COATER in retracted position.



CALENDER SECTION of the Triplex machine (left) has hot and cold ironing drums. Hood and sweat catch-pan form a steaming section. Third coating station is at right.



WINDUP END of coating machine. Winder control console is partially hidden. Sheet at top is rounding a chill drum prior to entering steaming hood.

The coating stations are of the conventional type having two applicator rolls and two hold-down rolls mounted on swinging arms. The applicator rolls are driven by a variable speed motor.

The air knives for solution doctoring are the standard Ozalid design type and are mounted on brackets developed by Ozalid for quick release, precision adjustment, self-locking, and easy retraction.

Drying ovens

The three drying ovens are identical in construction. Each oven is separated into four zones, each zone being equipped with six Chromalox far-infrared radiant panels. Each panel is 12″ x 48″, rated at 440 volts, 10.8 kw., three-phase, three panels on top and three on the bottom spaced at 4″. The top and bottom banks of panels in each zone are mounted on frames fastened together, making an integral carriage equipped with rollers riding on tracks. The four zones comprising one completely enclosed oven are interlocked and retract horizontally and simultaneously as one unit. The 24 panels in each oven have a capacity of 259.2 kilowatts. The temperature of the top 1′ is controlled by one Taco-West Temperature Control Unit, and the bottom 12 by another control unit. On the operator's side of the machine there are provided fixed Pyrex windows in each zone to permit the operator to observe the interior of the oven. The center section of each oven is provided with an exhaust duct furnished with a fan capable of exhausting 3300 cfm.

The calender stack is comprised of four large diameter rolls, two of which are cooling and two heating drums. They are driven through a train of connecting gears by a 3 horsepower motor, synchronized in speed with the main drive reference motor.

Winder

The automatic winder is similar in principle to the automatic unwind, described above, except that it operates in the reverse manner. In addition to the two mechanical variable speed devices, as similarly used in the unwind unit, this winder has incorporated two electrical variable speed devices. This combination controls the motor drive elements through a dancer roll actuating a short stroke reactor; thus ensuring constant web tension throughout the roll run. In contrast to the unwind cut-off knife, the winder cut-off knife is designed to cut the running web and tuck it in on a make-ready core for the start of a new roll without losing web tension. The winder is also equipped with two 3½″ diameter Tidland pneumatic shafts accommodating rolls up to 38″ diameter varying in widths from 24″ to 44″. The winder control panel is identical to the unwind control panel.

Drive and Controls

The coordinated Reliance V*S drive is contained in three floor mounted V*S cabinets. One houses the power unit for the machine proper and its associated units for field synchronization, excitation, acceleration and deceleration of the entire drive, and the necessary magnetic control components for the drive; the other two cabinets house the unwind and winder booster generator power units with their necessary respective reduced voltage starters, controls for mechanical variable speed devices, and balancing resistors for new roll synchronizing tachometers.

The operator's main control panel, floor mounted cabinet, houses a main line speed indicator; main run potentiometer; "Run," "Thread," "Stop," and "Emergency Stop" push-buttons; "Start-Stop" push-buttons for the Main, Unwind and Winder V*S units; calender and pull roll ammeters; three line speed indicators for the coater motors with Vernier rheostats for adjusting their respective speeds; "On-Off" push-buttons for actuating applicator hold-down rolls; and "On-Off" push-buttons for the air knife blower. This panel also houses six Taco-West Temperature Control Indicators, two for each oven, top and bottom; and 24 "On-Off" selector switches for turning on individually the Chromalox Radiant panel banks in each zone of the drying ovens. The push-button switches for actuating the oven retraction motors are also located on this panel.

Thread-up

The general web thread-up through the machine is from one of two unwind reels through the unwind booster generator dancer roll and into the first coater or back-wet station. Leaving the coater it passes under an air knife and into the first oven, from whence it is pulled by the first pull roll cluster driven by the main reference drive motor. It then passes into the second coater or base-coat station; under the second air knife; through the second oven and over a dancer roll, which controls the speed of the second pull roll cluster motor, which pulls the web out of the second oven. The web then enters the third coater or sensitizer station, passes under the third air knife, into the third oven and over another dancer roll controlling the calender motor. From the calender rolls the web passes through a dancer roll controlling the winder booster generator and then winds up on one of two winder shafts driven by one of the two winder motors. For two-station coating, the third coating station and oven can be by-passed.

The electrical power for the Triplex coating machine is supplied through its own Roller-Smith sub-station having a transformer section consisting of a 1000 kva. Uptegraph dry type 4800/440 transformer, 3 phase, 60 cycle; and two feeder breaker sections, each section containing two 600 ampere air circuit breakers. All motors and heaters are run on 440 volts.

The Triplex coating machine is approximately 9′ wide x 90′ long x 10′-7″ high, and is capable of producing about 83,000 square feet per hour of 44″ wide coated paper.

As might be surmised by operations personnel, a machine as complex as this one did not start coating paper when the "Run" button was pressed. After completion of construction, a considerable period of time was required to adjust the complicated electrical and mechanical components to achieve the desired results. A number of unforeseen "bugs" had to be worked out and corrected. But the soundness of electrical radiant drying on a large scale was quickly determined.

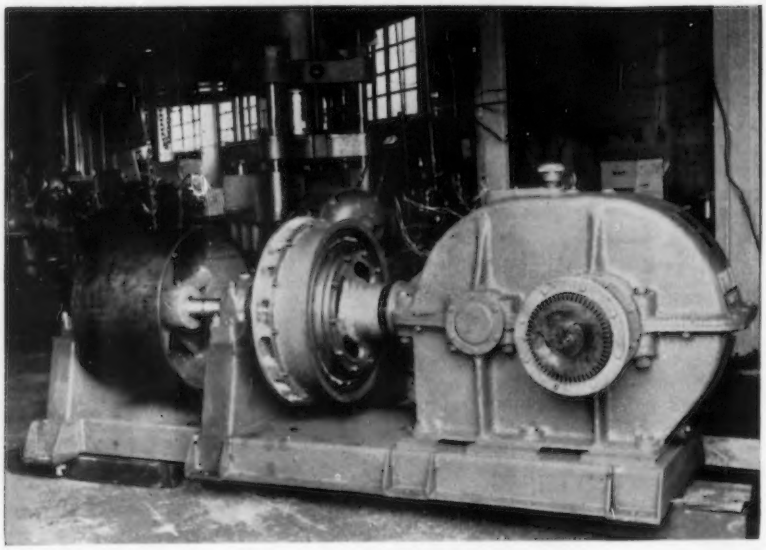
Lewis Container Changes Name and Adds New Plant

Lewis Container Co. has changed its name to American Box Board Co., Inc. The new container plant being completed in Madison will be a branch plant in the company's facilities. The officers and directors of this Wisconsin corporation will remain the same.

Following the company's merger early last year with the American Box Board Co., its container plant at Colby was extensively expanded and the administrative and sales offices were moved from Colby to Wausau.

The new plant in Madison was expected to be in operation around January 1. It will be managed by Robert K. Stolz, Jr. Located on Packers Avenue, and designed to be expanded, this new manufacturing operation will produce shipping containers made from containerboard produced by American Box Board Co., which has mills and converting plants in Grand Rapids, Filer City, Chicago and Kalamazoo, in addition to the plant at Colby, Wis. A duplicate of the Madison Plant has been built at Kalamazoo, Mich. as a part of a wide expansion plan.

NEW EQUIPMENT AND SUPPLIES



New Mechanical Drive Line Added

The Jelks Co., 3000 Princeton Ave., Middletown, Ohio, has announced production on a new complete line of mechanical paper machine section drives. All types are of enclosed spiral bevel design and are equipped with anti-friction bearings throughout.

Airflex clutches are furnished as standard equipment in both cut-off and close-coupled design. Reversing mechanisms are supplied for calender and other sections where wadding is a problem.

Air Switch Has Small Size and High Electrical Rating

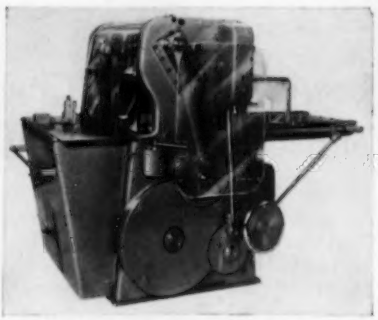
An air switch which occupies little over 5½ cubic in. and has a rating of 15 amps. at 120-250 volts a.c. useful with components used in electronic equipment is announced by Henry G. Dietz Co., 12-16 Astoria Blvd., Long Island City 2, N. Y.

The vane type pressure air flow switch, called Cat. 115, will operate a control relay to guard against tube failure in the event of blower failure or air passage obstruction. It is the smallest switch with maximum current capacity now obtainable, the manufacturer states.

Fabricated of sheet steel with an actuating vane of aluminum, extreme sensitivity is made possible by a snap-action switch that is operated by a duct-traveling vane, sealed by a window-shade-type silicone coated glass cloth diaphragm.

Controls are made to operate on a static pressure of 1.5 in. w.c. or more. At low operating pressure, differentials of approximately 0.7 in. w.c. are experienced. As pressure is increased in value to 3 in. w.c., on-off differential becomes 1 in. w.c. At pressures such as 7.5 in. w.c., on-off differential is 1.5 in. w.c.

Switch, for best operation, should be mounted on vertical surface. Electrical connections are screw terminals. Required operating pressure is factory adjusted, with slight field adjustments possible in the field.



Three Knife Trimmer With Automatic Operation

A new series B 3-knife Rapid Trimmer, which features an automatic two-up device as standard equipment, is announced by E. P. Lawson Co., 426 W. 33rd St., N.Y. 1, N.Y. The trimmer is designed for simple operation, increased output, and greater accuracy

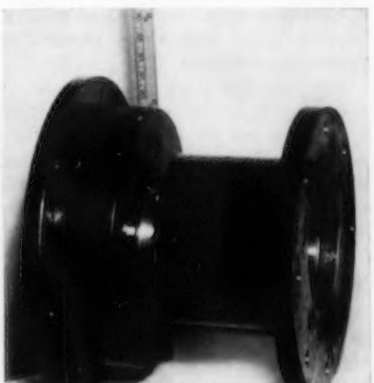
In just one operation, the two-up device splits the pile and trims a lift of bound work. While one-half is trimmed on three sides the other half is automatically returned to the operator for completion. During the entire operation the pile remains firmly clamped in position. A long shear angle guillotine knife action cuts smoothly and with maximum accuracy.

The trim handles a wide range of sizes. Lifts as high as 4¾ in., in sizes 2 x 3⅛ in. to 11¾ x 16⅞ in. are trimmed automatically. Speeds from 12 to 25 piles per minute are controlled by the operator. Larger cutting sticks enable changes in size to be made quickly and easily, reducing set-up time to a minimum.

An overload device is included on the 3-knife model, and prevents damage and jam-ups in the event the operator fails to make the proper adjustments when changing sizes.

Moving parts are enclosed for maximum operator protection. A Plexi-glass guard allows the operator to observe the job while trimming is in progress. The unit can be stopped at any point during the cutting cycle by a light touch on the clutch release handle.

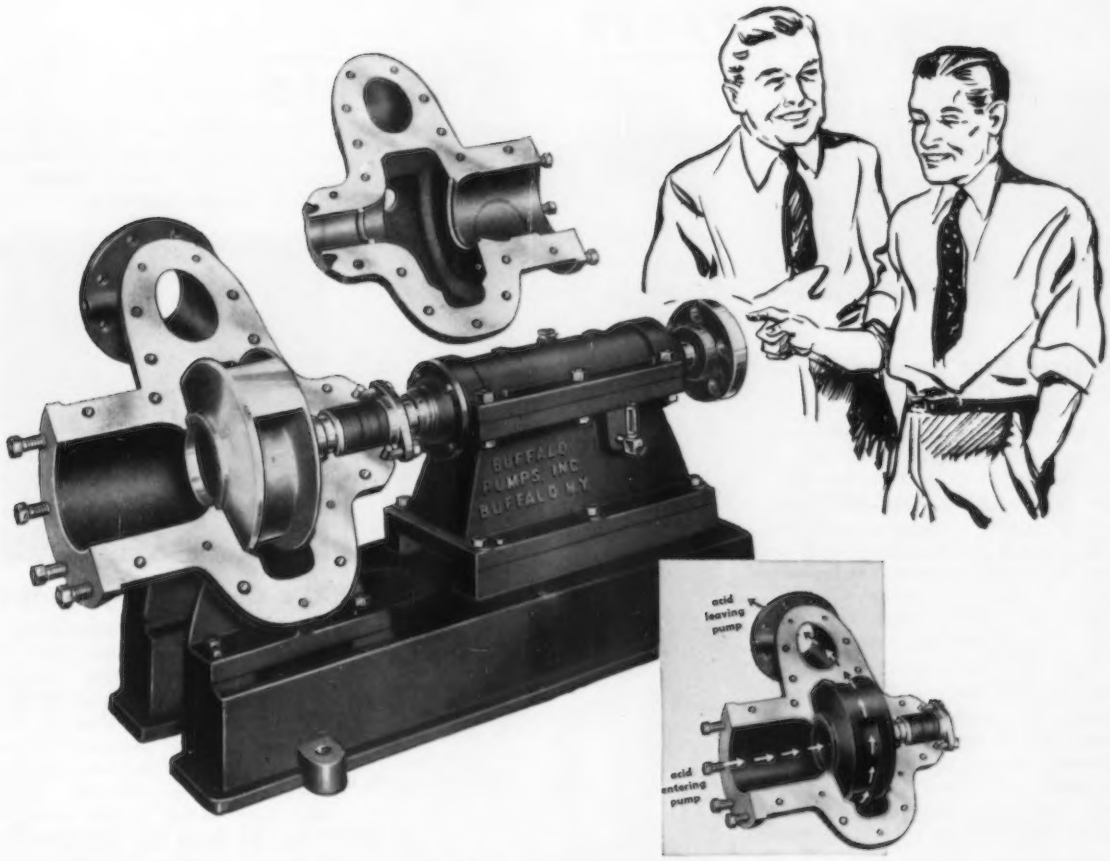
An in-feed device with an adjustable gib enables the machine to automatically in-feed, clamp, trim, and deliver the finished work to the conveyor belt.



Revolving Joint for Yankee Dryer Installations

A new type revolving joint in 5 in. pipe size for use on Yankee dryers is announced by Rotherm Engineering Co., Inc., 7280 W. Devon Ave., Chicago 31, Ill.

The joint has a 1½ inch off-set in the flange and a large bell-shaped rotor to fit over the roll bearing. The unit can take care of the eccentric rotation of the roll as well as compensate for end expansion in the roll itself.



Ask the MAINTENANCE DEPT. why this "BUFFALO" pump costs so little to run!

Chances are, the first reason given will be *freedom from troubles.* In the Type "DS" Stock Pump above, the impeller is the enclosed "Buffalo" non-clogging type. It does not depend on close running tolerances for its efficiency. High-consistency stocks flow freely through the pump with no tendency to "wedge." Second, the maintenance man likes "Buffalo" serviceability. Note how upper half of the diagonally split-shell casing is removable without disturbing discharge piping—giving full visibility and access to impeller and stuffing box. Here is a stock pump that will be saving you money years after installation. It's all part of the "Q" Factor* that has made "Buffalo" products so popular for the past 79 years.

FOR YOUR CORROSION PROBLEMS—

"Buffalo" Diagonally Split-Shell Stock Pumps are available rubber-lined. The liquid touches only rubber—never the metal as shown above. There's a long life "Buffalo" Pump for every stock job in your plant, fully described in Bulletin 953. Write for your copy!

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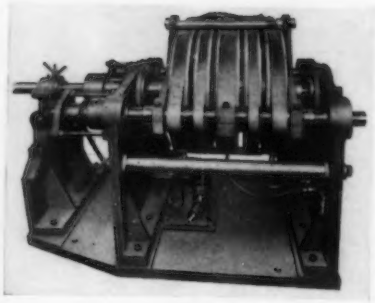

Multiple Disc Unwind Brake Is Water Cooled

A recent advancement in unwind braking equipment by Kidder Press, Inc., 21 East 40th St., N. Y., N. Y., is now available for equipment requiring higher braking capacity. The unit is designed to accommodate either 15 in. or 20 in. diameter braking elements, and is also readily adaptable for assembly as a 2, 3, or 4 disc unit, allowing for a wide range of horsepower requirements.

Brake action is controlled pneumatically from the operator's control panel. Satisfactory operation requires compressed air at 30 lbs. per square inch maximum pressure. Standard equipment includes a water pressure reducing valve, which permits connection to any available water supply for cooling purposes.

Anti-Static Agent Facilitate Cutting and Trimming

A new product, called Larostat-738, designed for positive static and dust control in papermaking, is announced by W. H. & F. Jordan, Jr. Mfg. Co., Inc., 2126 E. Somerset St., Phila. 34, Pa.

The 100 per cent active powdered antistatic agent has excellent dispersibility and is compatible with most surface sizing materials such as starch, clay coating compositions, glue, gelatine, and synthetic resins, the manufacturer states. Its physical properties include a noncaking crystalline appearance, white color, a slight characteristic odor, solids content of 100 per cent, water soluble, and stability to boiling in either dilute acid or dilute alkali. The item forms substantially neutral solutions and is compatible with nonionic and cationic materials. It is also stable to hard water and polyvalent salt solutions.

Recommended use is for tub sizing operations, at a typical commercial mixture of 35 lbs. of the product to 1000 gallons of a prepared tub size containing 1 lb. of starch per gallon. Application of tub size is normal, and no modifications are listed for drying.

P. D. Quinnett

E. E. Puckett

Hinde & Dauch Promotes Quinnett and Puckett

Patrick D. Quinnett has been appointed plant production manager of the Chicago factory of Hinde & Dauch Paper Co. Announcement was also made of the appointment of Edwin E. Puckett as plant production manager of the H & D Richmond plant. Mr. Quinnett, who joined H & D in 1941 as a payroll and production clerk, was serving as production control supervisor prior to the appointment. With H & D since 1949, Puckett was a foreman at the Richmond factory before assuming his present duties.

Champion Promotes Two At Ohio Division

Two recent promotions at the Champion Paper and Fibre Co. have been announced by John W. Zimmerman, vice-president and general manager of the Ohio Division, Hamilton, Ohio.

Larry Schelter has been advanced to the position of assistant superintendent of the Unloading and Storage Department, and Oliver Swanner has been promoted to assistant general foreman of the Roll Storage Department.

K-C's Charles Sage Retires

Charles H. Sage, vice-president of Kimberly-Clark Corp. since 1937 and president of its Canadian associate, Spruce Falls Power and Paper Co. Ltd., since 1942, has retired after 48 years of service with the company in which he started as a mail and messenger boy. He will continue as a director.

Mr. Sage worked in the order and billing department and in bookkeeping and accounting before his assignment as a salesman. He served as midwestern sales representative in Chicago for nearly five years and then moved into the New York eastern sales district office where he worked for 14 years.

Called back to Neenah in 1932 for an administrative assignment, Mr. Sage became a director of the company that same year and vice-president in 1937.

Active in both Canadian and United States organizations, Mr. Sage has been chairman of the United States Forest Industries Council, a member of the American Forestry Assn.'s policy committee, a trustee of the American Forest Products Industry and the American Forest History Foundation. He was chairman of the forest conservation committee for the National Assn. of Manufacturers and a member of the Forest Policy committee of the American Paper and Pulp Assn.

In addition to his office with Kimberly-Clark and Spruce Falls Power and Paper Co., he has been vice-president of LongLac Pulp and Paper Co. Ltd. of Terrace Bay, Kimberly-Clark of Canada at Kapuskasing, and Upper Canada Lumber Co., Longac, Ont.

He has served as a member of the executive committee of the Canadian Pulp and Paper Assn. and the Newsprint Assn. of Canada.

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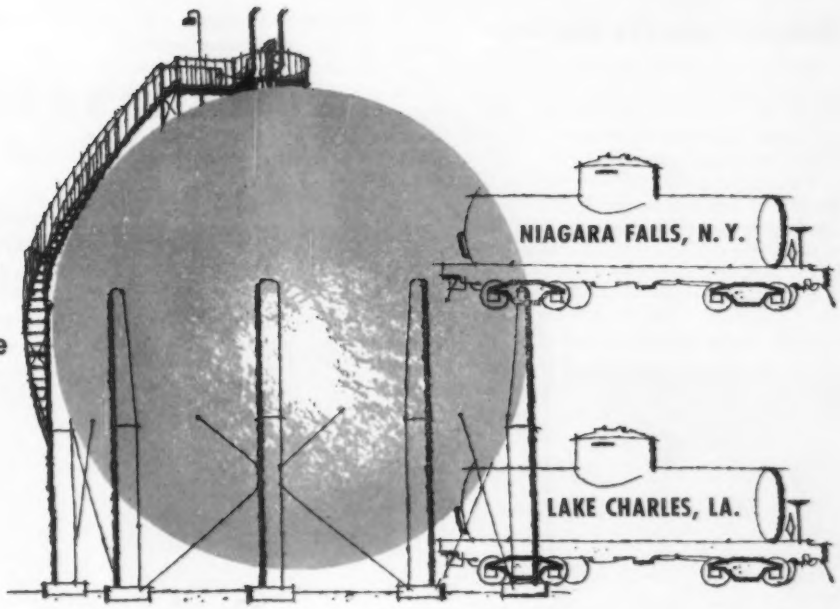

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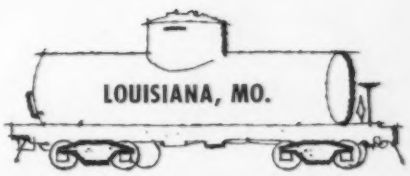

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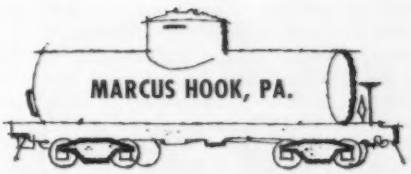

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Oxford Promotes Morrison

Delbert J. Morrison, who has been cost analyst, manufacturing for the Oxford Paper Co., Rumford, Maine, has been promoted to executive secretary of the Oxford planning committee.

The planning committee of the Oxford Paper Co. was established by the board of directors in 1953 to fill the need for a continuous long range planning program for the company. William H. Chisholm, vice-president, is chairman of the committee. Other members are: Andrew McBurney, vice-president, sales; Harry J. Buncke, vice-president, engineering; Harold M. Annis, technical director; Philip L. Hovey, staff production manager; Richard F. Cadwallader, assistant treasurer; and O. S. Barrie, consultant.

As executive secretary to the planning committee Mr. Morrison will continue to be located in Rumford and will devote his full time to the long range planning activities of the company.

Mr. Morrison joined Oxford in 1927 as staff accountant, cost control. In 1953 he was promoted to cost analyst, manufacturing.

Michaud Made V.-P. of Consolidated Paper Corp.

J. A. Michaud has been elected vice-president in charge of woodlands of Consolidated Paper Corp. Ltd. Mr. Michaud was general woods manager of the corporation and replaces Francois Faure who is retiring as vice-president after fifty-one years service with the company and with its predecessor organizations. Mr. Faure with his background and knowledge will continue to be available to the corporation of which he continues to be a counsellor and director.

Francois Faure started with the Belgo Canadian Paper Co. in Belgium in 1904 and was sent by that company to Canada in 1905. During a long career, he has always been connected with the operation and management of woodlands and has been a pioneer in modern forest management methods.

Mr. Michaud first worked with the Quebec Streams Commission for two years and in 1920 was employed by the St. Maurice River Boom and Driving Co., Trois-Rivieres, becoming manager in 1923. He is now president of this company.

In 1926, he was appointed woods manager of the Port Alfred Pulp & Paper Corp. and, in 1936, was moved to Grand'Mere as woods superintendent for Consolidated Paper Corp. He was later appointed division woods manager and then, in September 1952, general woods manager.

In 1951, he attended the Harvard Advanced Management Program. He is a member of the Engineering Institute of Canada, Professional Engineers of Quebec, and is a Director of Quebec Forest Industries Assn., Woodlands Section of Canadian Pulp and Paper Assn., and a director of several forest protective associations.

H. C. Davis

A. L. Park

Davis and Park Promoted by Bemis

H. C. Davis, manager of Paper Specialty Plants, Bemis Bro. Bag Co., has been appointed a director of operations with responsibility for operations connected with certain of the company's more recently developed products. He will be succeeded as manager of Paper Specialty Plants by A. L. Park, now assistant to Judson Bemis, director of Central Operations.

Mr. Davis started with Bemis in 1942 in the Market Research Department, working on the development of new products. The following year he established and was made manager of the new Paper Specialty Plant in St. Louis. As the Bemis paper specialty operation grew and expanded into other plants, a new title was created and in 1954 Mr. Davis was made manager of Paper Specialty Plants with responsibility for the operations at St. Louis, Albion, N. Y., and Crossett, Ark.

Mr. Park joined Bemis in 1949 in the General Personnel Department, St. Louis, and in 1952 was made personnel manager at the company's paper mill and multiwall bag factory at Peoria. His present position as assistant to the director of Central Operations dates from 1954.

Seelye, Gardner, Dore Retire from Great Northern

Several long time members of Great Northern Paper Co. were retired recently and were honored at a banquet in Millinocket, Maine.

Bryan L. Seelye, general auditor and clerk of the corporation for about 40 years, has lately served as Millinocket townsite manager and treasurer of the Millinocket Water Co.

Delbert G. Gardner retires from position of paper consultant. He formerly worked as beater room and paper superintendent.

Edward A. Dore retires as a chemist, having worked at Great Northern since 1919.

Charles Glaster, superintendent of woodlands in the Millinocket districts, began with Great Northern as a clerk.

Also retiring are Parker F. Crabtree, electrical foreman; Raymond E. Oliver, storekeeper; Arthur Winslow, asst. electrical engineer; Clinton Astle, night foreman in woodroom; M. J. Embleton, sulphite foreman; and A. F. Gonya, payroll clerk.

Grimnes and Mahana Join Ebasco Services

S. H. Grimnes and Everett Mahana, well-known paper mill engineers in the Northeast, are now project engineers with Ebasco Services, Inc., New York City. They will work under the direction of A. P. Schnyder, Ebasco's chief paper mill engineer.

Mr. Grimnes is the former chief engineer for Diamond Match Co. at Plattsburg, N. Y. Mr. Mahana has been an electrical and plant engineer for International Paper Co. at several northeastern mills; for Dexter Sulphite Pulp & Paper Co., Dexter, N. Y., and for St. Lawrence Paper Corp., Norfolk, N. Y.

Parker Advanced by Herty Foundation

Ralph B. Parker has been advanced to the post of pilot plant superintendent at the Herty Foundation Laboratory according to Dr. Reavis C. Sproull, director of the laboratory.

Mr. Parker has been connected with the laboratory for the past two years. He is a member of the American Pulp and Paper Mill Superintendents' Assn. and the Technical Assn. of the Pulp and Paper Industry.

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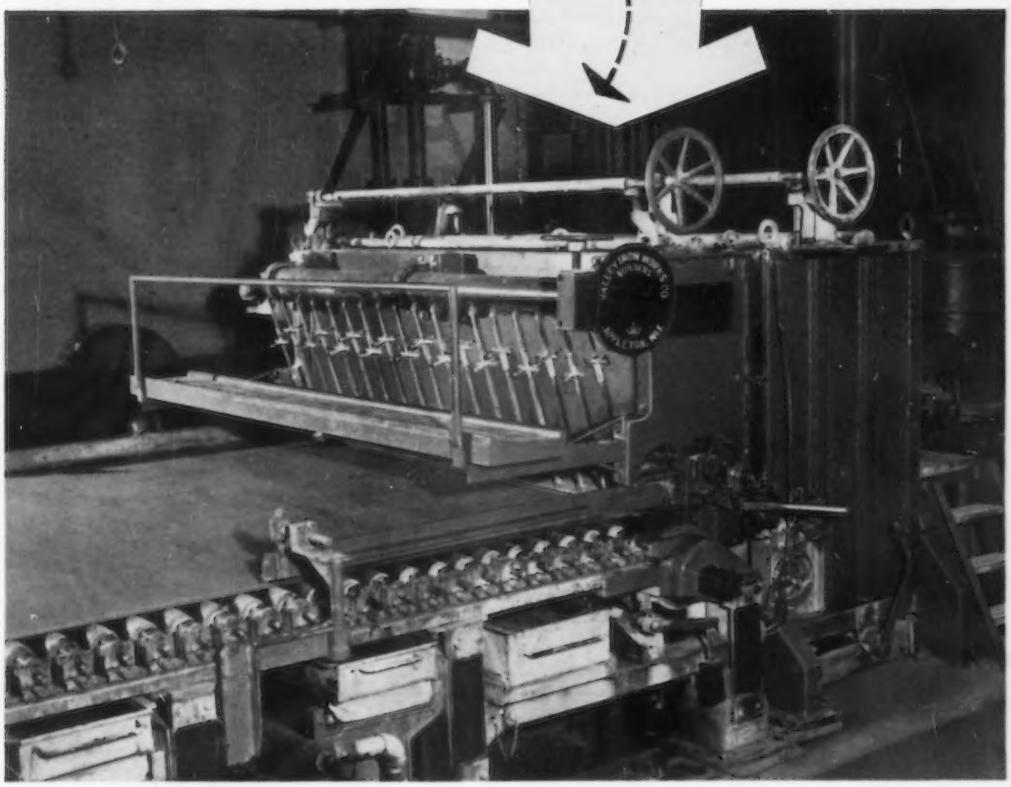
installs another VALLEY

No.1 machine at Bangor, Me.



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NEWS OF ASSOCIATIONS

Superintendents Local Meeting Dates

Date	Division	Place
Jan. 26	Miami Valley	Manchester Hotel Middletown, Ohio
Jan. 27	Connecticut Valley	Roger Smith Hotel Holyoke, Mass.
Feb. 9	Michigan Div.	Hotel Harris Kalamazoo, Mich.
May 18-19	Pacific Coast Join with TAPPI	Gearhart Hotel Gearhart, Ore.

TAPPI LOCAL MEETING DATES

Date	Section	Place
Jan. 20	Empire State Eastern Dist.	Queensburg Hotel Glens Falls, N. Y.
Jan. 20	Lake Erie	Hotel Carter Cleveland, Ohio
Jan. 20-21	Southeastern	Francis Marion Hotel Charleston, S. C.
Jan. 26	Delaware Valley	Engineers Club Philadelphia, Pa.
Feb. 1	Empire State Western Dist.	Prospect House Niagara Falls, N. Y.
Feb. 3	Empire State Central Dist.	University Club Syracuse, N. Y.
Feb. 9	Empire State Northern Dist.	Hotel Woodruff Watertown, N. Y.
Feb. 13	Chicago	Chicago Bar Assn. Chicago, Ill.
Feb. 14	Ohio	Legion Hall Middletown, Ohio
Mar. 1	Kalamazoo Valley	Hotel Harris Kalamazoo, Mich.
Mar. 2	Pacific	Shibley Award Camas, Wash.
Mar. 13	Empire State Metropolitan	Fraunces Tavern New York, N. Y.
Mar. 13	Lake States	Hotel Conway Appleton, Wis.
April 6	New England	Roger Smith Hotel Holyoke, Mass.

Coater Group Meets To Discuss Technical and Production Problems

The Polyethylene Extrusion Coaters Group, an organization formed under the auspices of the Specialty Paper & Board Affiliates and made up of paper mills and converters engaged in polyethylene coating, met recently with representatives of the E. I. du Pont de Nemours & Co., Inc. for the purpose of discussing technical problems involved in extruded polyethylene coating of paper and board.

Several talks by Dupont representatives highlighted the meeting. Dr. E. C. Bernhardt discussed in considerable detail principles of extruder design, the application of design information, adiabatic extrusion, die design and instrumentation.

J. E. Guillotte presented a talk on caliper control, adhesion, maintenance of equipment and recovery of edge waste. Another speaker, R. H. Hardesty described current product standards for Alathon, resin extrusion processes, end use properties in their relation to melt index and density and molecular weight distribution.

Some of the objectives of the new polyethylene group are to collect and disseminate to members production statistics, capacity data, and trade names, which will also serve government agencies and prospective buyers; to establish standards of quality including classification of basic raw materials; and to assist government agencies in establishing specifications for defense and other government requirements. Headquarters for the group are currently at 122 E. 42nd Street, New York City.

Southeastern TAPPI To Meet January 21

The next meeting of the Southeastern Section of TAPPI will be held at the Francis Marion Hotel, Charleston, S. C., on January 20. On January 21, those in attendance will visit the Southern Kraft Division of International Paper Co., Georgetown, S. C.

The technical program will consist of four papers:

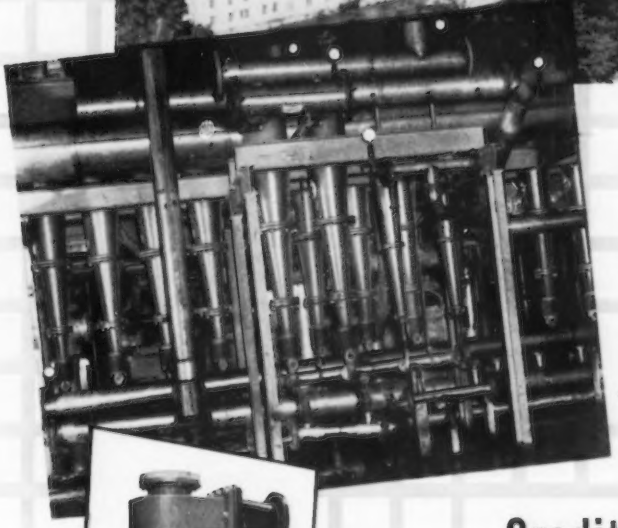
"Developments in High Yield Kraft Pulping at Fernandina," by George Whiteside, Container Corp. of America.

"Description of the Rome Mill," by George Reynolds, Georgia Kraft Co.

"The Development of Automatic Digester Controls at Pensacola," by R. G. Cohn and C. W. Rothrock, St. Regis Paper Co.

"The Role of Liners in the Scoring and Folding of Corrugated Board," by R. C. McKee, The Institute of Paper Chemistry.

Plant of Chase Bag Company, at Chagrin Falls. Since 1848, producers of high quality kraft converting papers, including spinning, twisting, interleaving, and machine creped grades.



Bauer Pulp Cleaners at Chase Bag Company

Credits *BAUER CLEANERS* for cleanest kraft ever seen . . .

Sixteen Bauer Cleaners at Chase Bag Company Chagrin Falls, Ohio, are providing an extremely clean sheet.

"The Bauer Cleaners are doing a marvelous job," says General Manager J. A. Extrom. "I personally have never seen as clean a paper produced by any kraft mill as we have been making since the Bauer Cleaners have been in full operation."

General Superintendent Ralph Pierson states that, among other savings, wire life on their machines has been greatly extended by Bauer Cleaners' removal of sand and grit along with shives, bark, slivers, etc., from the stock.

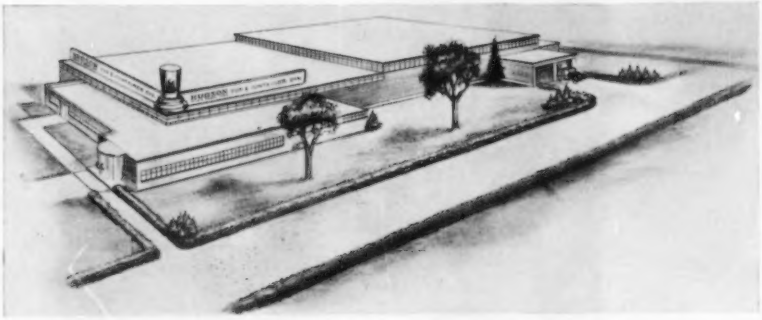
Get the full story on Bauer Cleaners. Send for bulletin.

Bauer

THE BAUER BROS. CO.

1758 SHERIDAN AVE. • SPRINGFIELD, OHIO

NEW OF CONVERTERS OF PAPER AND PAPERBOARD



Hudson's First Cup Plant To Be Built Near N. J. Turnpike

A nine-acre plot in Carteret, N. J. at Interchange 12 on the New Jersey Turnpike will be the site of Hudson Pulp & Paper Corp.'s first paper cup and container plant. Hudson president William Mazer has released sketches and details of the plant's construction, scheduled for completion next summer. The projected mill is regarded as a pilot operation, with additional production points contemplated in the future.

The purchase of the property was negotiated by the Newark Realty firm of Alexander Summer & Co. The total cost of land, building, machinery and equipment, according to informal estimates, will be "just under $2,000,000."

The plant itself was designed by David Levy, a New York architect who will also supervise construction. A one-story building encompassing manufacturing, warehousing and office space, it will have provisions for a quality control laboratory and completely mechanical materials handling operations.

The rectangular structure will have a facade of light-faced brick. The interior walls of the manufacturing area will be of clear plastic tile for ease in cleaning, and to insure maximum dust control, the plant will be completely air-conditioned. The conditioning system has been designed to include the special humidity controls.

Hudson's new Paper Cup & Container Division is the latest step in the firm's expansion program begun 10 years ago. Hudson now owns and operates mills in Florida, Vermont, Maine, West Virginia, Arkansas and North Carolina. Now under construction is a $15 million expansion of facilities at Palatka, Fla., which will be completed in the spring.

"As was the case with our Palatka plant, the Carteret site was chosen, in large measure, for its expansion possibilities," Mr. Mazer said. "It has been our policy to select sites and building designs allowing flexibilitiy for stepped-up production to meet increased demand.

"Our entrance into the paper cup and container field carries forward another long-range company policy—of achieving the broadest possible product diversification consistent with sound business principles."

Corrugated Container Co. Plans Expansion

Scheduled improvements totaling $400,000 during 1956 were announced at the annual Corrugated Container Co. meeting of its sales and supervision staff at the Deshler Hilton, Columbus, Ohio.

Manufacturing space of the Columbus plant is being increased by 40,000 to a total of 135,000 sq. ft., railroad handling facilities are being doubled to handle 10 cars at one time, as well as complete new loading dock for 11 truck trailers.

Refinements being added to the company's corrugating machine are expected to increase production 25%.

Hoerner Plans Little Rock Plant

Hoerner Boxes, Inc., has announced that it would more than triple earlier expansion plans and build a $1.5 million paper box factory at Little Rock, Ark.

Box Company to Move To Conway

The Ray Paper Box Co., of Little Rock, Ark. will move its plant to Conway, Ark. as soon as a new $61,000 building to house it is complete.

Eastern Corp. Enters Tape Field With English Firm

Harold Holden, president of Eastern Corp. of Bangor, Maine, and E.S. & A. Robinson Ltd. of Bristol, England, jointly announce the formation on January 4th under New York State laws of Ascot Chemical & Adhesives Corp. During 1956, this new corporation will establish a plant in the United States to manufacture and sell a broad line of plain and printed pressure-sensitive transparent tapes and related adhesive products now produced and sold in world markets by Adhesive Tapes Ltd. Boreham Wood, England, a wholly-owned subsidiary of E. S. & A. Robinson Ltd.

The new corporation will have initial paid-in capital of $1 million owned 80 per cent by Eastern Corp. and 20 per cent by Adhesive Tapes Ltd., and will be operated and managed as a subsidiary of Eastern Corp. Pending completion of manufacturing facilities, Ascot plans to import the full line of pressure-sensitive tapes and similar products from England and establish distribution in the United States.

Galante Sales Firm Takes Over Wheeler Paper Corp.

Tagsons Paper, Inc., sales organization for Thomas A. Galante & Sons Paper Co., Mechanicville and Warrensburg, N. Y., has taken over the Wheeler Paper Corp. of Albany, N. Y. through acquisition of stock.

Operations of the Albany paper converting concern will be transferred to the Galante plant at Mechanicville.

The Mechanicville paper mill has been gradually coming into production of the toilet and toweling grades that will be finished and packaged on the equipment of the former Wheeler firm.

Corrugated Box Plant To Cease Operations

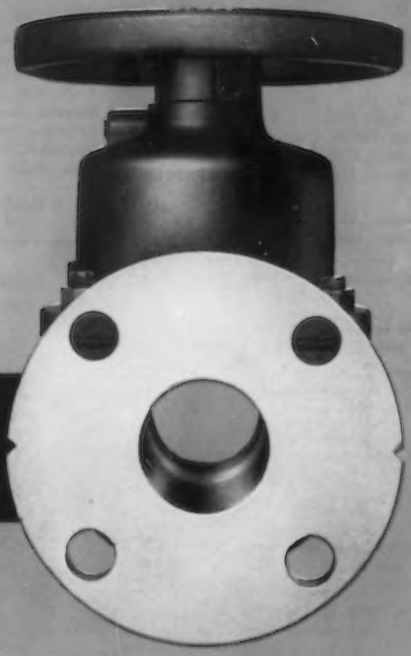
The former Champion Container Corp. plant in Le Roy, N. Y., which has been part of the Krafco Corp. since September, 1954, will cease operations, it was reported. It manufactures corrugated boxes.

Diamond Box Moves To Larger Quarters

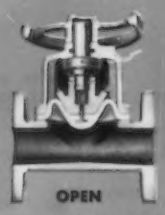
Diamond Paper Box Co., manufacturer of folding and corrugated boxes in the Delaware Valley area, has moved into larger quarters at 1330-40 Unity St., Philadelphia, Pa. The new location includes a modern-type building and warehouse comprising approximately 75,000 square feet.

Announcing...
the new,
exclusive

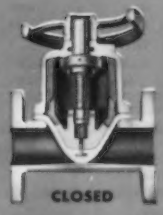
GRINNELL-SAUNDERS STRAIGHTWAY DIAPHRAGM VALVE



...the diaphragm valve with
STRAIGHT-THROUGH FLOW,
for handling viscous materials,
fibrous slurries, sludges, pulp
stock, latex, magmas, semi-fluid
foods, solids in suspension,
sewage, water, corrosive chemicals



Diaphragm lifts high for streamline flow in either direction. No pockets to trap sludge



Diaphragm presses tight for positive closure even when handling gritty or fibrous materials

Grinnell-Saunders STRAIGHTWAY Diaphragm Valve* offers you these exclusive features: the ability to handle viscous materials without restriction or stoppage; minimum pressure drop; rodding or brushing without need of removing bonnet and without possibility of damaging body linings; self-draining when line is pitched sufficiently to drain piping.

Grinnell-Saunders STRAIGHTWAY Diaphragm Valves are available in a range of body, lining and diaphragm materials. Inquiries invited. Bulletin on request.

*Patented

GRINNELL COMPANY, INC.
240 West Exchange St., Providence, R. I.

Kindly send me a complimentary copy of your "Grinnell-Saunders Straightway Diaphragm Valve" bulletin.

Name _____

Title or function _____

Company _____

Address _____

City _____ State _____

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

PRICES OF MATERIALS

Aluminum sulphate:		
cml. bags, c.l. wks. .....cwt.	$1.85	/ —
iron-free, c.l. wks. .....cwt.	3.55	/ —
Casein, acid prec.:		
dom. sh. pt. c.l. (30 mesh)...	32.00	/33.00
Arg. ex. dock, duty paid.....	31.00	/32.50
New Zeal., do.	26.50	/27.50
Caustic soda:		
c.l. wks. solid, 76%.....cwt.	4.50	/ —
flak. & grd. 400-lb. drums, c.l.	4.50	/ —
liquid 50% tanks....	2.80	/ —
liquid 70% tanks....	2.90	/ —
China clay:		
dom. air-float, c.l. wks. ..ton	10.00	
water-washed, lump, filler..ton	11.00	
coating .....ton	17.60	/40.00
Imported, ex. ship..short tons	20.00	/35.00
Chlorine:		
single-unit tanks, works..cwt.	.3.05	/ —
multiple unit, 2-5 cars per yr.	3.92	/ 5.12
Formaldehyde:		
USP, inh. dms. c.l. wks..lbs.	.0675/	—
lcl., E. wks. .....lb.	.072	/.0725
Lime:		
hydrated bags, wks.....tons	18.71	/20.21
Gum rosin:		
K, M, N, drms, c.l. Savan, cwt.	8.48	/ 8.76
Rosin size:		
70%, gum & pale grds., tank cars, south, sh. pt.....cwt.	7.24	/ 7.28
Salt cake:		
dom. bulk, 100% anh. wks. ton	28.00	/ —
imp. f.o.b. Saskatchewan..ton	18.00	/ {Cana. funds}
Soda ash:		
light, 58%, bags, wks.....cwt.	1.80	/ —
bulk .....cwt.	1.50	/ —
Sodium silicate, 40° Be.:		
tank-cars, wks.....cwt.	1.00	/ —
drums, c.l. wks.....cwt.	1.35	/ —
(47°) Be. WW.		
tank-cars, wks.....cwt.	1.60	/ —
drums, c.l. wks.....cwt.	1.95	/ —
Sodium peroxide:		
dms. c.l. E. of Miss. .....lb.	.186	
l.c.l. do. .....lb.	.191	/ .196
Soybean, protein:		
chem. isol., wks. c.l. bags...lb.	.23	/ —
Sulphuric acid:		
60° Be. cbys. c.l. wks....cwt.	2.00	/ —
l.c.l. wks.....cwt.	2.45	/ —
tank-cars, wks.....ton	18.60	/ —
Sulphur:		
crude, c.l. mines, contract, long ton	26.50	/ —
f.o.b. vessels Gulf.....do.	31.00	/33.00
Sulphur dioxide:		
liquid, coml. cyl., wks.....lb.	.10	/ .12
multi-unit cars .....lb.	.0535/	
Starches:		
corn, multiwalls, c.l. prod. plant:		
pearl .....cwt.	7.13	/ —
white, dextrins .....cwt.	7.55	/ 7.80
chlorinated .....cwt.	8.15	/ —
potato, Idaho, c.l. wks....cwt.	6.00	/ —
East, fr. all. 50 cents cwt.		
potato, Maine. f.o.b. wks. cwt.	5.75	/ —
Talc:		
domestic, sacks, c.l. wks., N.Y. .....ton	27.00	/32.00
Titanium dioxide:		
anatase, c.l. deld. E, bags..lb.	.22½/	—
l.c.l. deld .....lb.	.23½/	—
rutile, c.l. deld. .....lb.	.24½/	—
l.c.l. deld. .....lb.	.25½/	—

PRICES OF FIBERS

MARKET WOOD PULP

First Quarter Contract Prices Per Short Air-Dry Ton

	Delivered Basis		Varying Freight Allowances†		
	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	§$83.00/ 86.00§	§$83.00/ 88.00§	§$77.50/ 90.00
Kraft, Blchd.	147.00/152.00	150.00/155.00	§147.50/150.00§		§150.00/ —
Kraft, Blchd. Hdwd.	145.00/ —		§137.50/ —		
Kraft, Semi-bleached	135.00/140.00	135.00/140.00	§137.50/140.00§	*140.00/ —	
Kraft, Unbl.	115.50/125.00*	115.00/125.00	†120.00/130.00	120.00/145.00	
Sulphite, Blchd. ..	145.00/150.00	150.00/ —	*150.00/ —	*150.00/ —	145.00/147.50†
Sulphite, Unblchd. .	125.00/ —	130.00/ —	†130.50/ —	*130.00/ —	
Sulphite, Unb'l. Gl'sn		129.00/ —	†129.00/ —		
Soda, Blchd.	142.50/145.00	145.00/ —			

‡ F.o.b. Shipping Point. § On Dock Atlantic Ports. * Freight allowed.

NEW YORK RAG MARKET

New Domestic Cotton Cuttings
Delivered Mill Basis
PRICES NOMINAL

	Per 100 lbs.
No. 1 White Shirts .....$15.25/$15.50	
No. 1 Unblchd. Muslins	17.00/ 17.50
Blchd. & Unblchd. Underwears....	17.00/ 17.50
No. 1 Light Silesias	7.25/ 7.75
No. 1 Light Blue Overalls	9.00/ 9.50
Percales	7.00/ 7.50
No. 1 Light Prints	5.75/ 6.25
Suntan Khakis	6.00/ 6.50
Cottonades	3.50/ 4.00
No. 1 Washables	3.00/ 3.50

Old Domestic Cotton Rags

(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$3.00/$3.50
Cotton Pants & Overalls	2.25/ 2.75
Thirds and Blues, Repacked	1.75/ 2.00
No. 2 Roofing	27.00/ —

COTTON LINTERS

Memphis Market
F.o.b. Oilmills

	Dec. 27 Per 100 lbs.
Grade 1 n.a.	
2	$9.10/ $7.70
3 1st cut—felting	7.00/ 5.80
4	5.25/ 4.20
5	3.75/ 3.05
5	2.65/ 2.50
7	2.50/ —

*Based on 73% cellulose.

Bagging

(Prices to Dealers, F.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$5.00/$5.25
Foreign Scrap Burlap	5.00/ 5.25
Heavy Wool Tares	6.50/ —
Austr. Wool Pouches	4.75/ 5.25
Domestic Manila Rope	7.50/ 8.00
Domestic No. 1 Sisal Strings	4.25/ 4.50

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point - Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York Jan. 9	Boston Jan. 9	Chicago Jan. 9	Los Angeles Jan. 9
No. 1 Mixed Paper	$16.00/ 18.00	18.00/ —	17.00/ —	14.00/ —
No. 1 News	25.00/ —	22.00/ 23.00	25.00/ —	14.00/ —
Overissue News	25.00/ 27.00	22.00/ 24.00	30.00/ —	14.00/ —
Mill Wrappers	25.00/ 28.00	22.00/ 26.00	20.00/ —	14.00/ —
Old Corrugated Containers	24.00/ 27.00	23.00/ 24.00	30.00/ —	19.00/ —
Super Resorted Kraft Paper ...	40.00/ 50.00	45.00/ 50.00	40.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts	40.00/ 42.00	40.00/ 42.50	40.00/ —	35.00/ 40.00
(Semi-chem. medium)	45.00/ 52.50	45.00/ 52.50	45.00/ 52.50	— / —
New 100% Kraft Corr. Cuts ...	55.00/ 65.00	55.00/ 65.00	75.00/ —	45.00/ —
New Br. Kraft Env. Cuts	85.00/ 95.00	85.00/ 95.00	80.00/ —	55.00/ —
New Br. Kr. Bag Waste Prntd.	60.00/ 70.00	60.00/ 65.00	70.00/ —	50.00/ —
New Br. Kr. Bag Waste Unprrtd	65.00/ 75.00	80.00/ 85.00	85.00/ —	— / —
No. 1 Groundwood Shvs.	35.00/ 45.00	32.00/ 35.00	40.00/ —	27.00/ 30.00
White Newsblanks	75.00/ 80.00	65.00/ 75.00	65.00/ —	65.00/ —
No. 1 Soft White Shvs.	80.00/ 85.00	80.00/ 85.00	80.00/ —	— / —
Hd. Wht. Shvs.	110.00/115.00	110.00/115.00	120.00/ —	95.00/ —
Hd. Wht. Env. Cuts	135.00/145.00	130.00/140.00	120.00/ —	110.00/ —
Col. Tab. Cards	70.00/ 75.00	75.00/ 77.00	65.00/ —	44.00/ —
Manila Tab. Cards, bales	95.00/100.00	95.00/103.00	100.00/ —	79.00/ —
No. 1 Col. Ledger	45.00/ 50.00	45.00/ 50.00	50.00/ —	35.00/ —
White Ledger	65.00/ 75.00	70.00/ 75.00	70.00/ —	55.00/ —
Mixed Book & Mag.†	28.00/ 30.00	30.00/ —	22.50/ —	— / —
No. 1 Rep'd. Hvy. Books‡	32.00/ 35.00	33.00/ 35.00	35.00/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡Not to exceed 10% groundwood. § Deld.

Fig. 1138 (left) non-rising stem, Fig. 1140 (right) OS&Y... two of 29 OIC iron valves with steel valve features. Metals used for trim and pressure parts in this line include: bronze, manganese bronze, nickel-plated steel, higher strength iron, nickel-alloyed iron, Monel, 18-8 stainless, 11-½-13 chrome.

Reduce valve wear. Choose from 29 OIC iron valve numbers with 9 different trim and body metal variations. Depend on them for general use and process industry services handling alkaline liquors, creosote, sour crude, sulphuric acid and caustics.

Working parts design assures positive seating . . . long life

Seat rings are end seated, reducing the probability of loosening in service and affording streamlined flow from port to port. Body wedge guides and a flexible T-head stem-wedge connection combine to assure accurate wedge seating for tight shutoff.

Extra strength adds safety to pressure parts

High-strength iron castings assure pressure parts made to a minimum tensile strength of 31,000 psi. The body and bonnet, elliptical in shape, resist internal pressure with least possible distortion. Body-bonnet bolting provides uniform gasket loading and, consequently, a pressure-tight seal throughout the pressure range of the valves. Tie ribs, cast between the pipeline flange and the body bonnet flange, prevent distortion from excessive pipeline stresses.

This line's many added features, trim variations, dimensions and end openings are completely described in the new OIC specification folder, Form No. 1005. Write for it.

Order valves from your OIC Distributor.

OIC
FOUNDED 1883

THE OHIO INJECTOR COMPANY • WADSWORTH, OHIO

VALVES | **FORGED & CAST STEEL, LUBRICATED PLUG, BRONZE & IRON VALVES**

POIRIER CONTROLS
Proven By Test To Be Best

Automatic Controls For
Weight
Consistency
Caliper
Metering
Proportioning
Make Up Water
Level Control
Associated Operations

Let our engineers study your operation and furnish you with complete details on how Poirier Controls will help you as they have others.

No cost — no obligation
Write For Full Information

POIRIER CONTROL COMPANY
Waterville 1, Maine
Specialists in Stock Control Equipment

Repair Your Own Wires
with
SAVA-WIRE
THE FOURDRINIER WIRE
PATCH
that saves:
TIME - MONEY - LABOR and MATERIAL - GIVES NORMAL LIFE TO A FOURDRINIER-WIRE THAT WOULD HAVE BEEN JUNKED.
INTERNATIONAL WIRE WORKS
Menasha, Wisconsin, U.S.A.

OBITUARIES

Dr. Raymond L. Mitchell, 49, a research chemist for 26 years with the U. S. Forest Products Laboratory, died December 23 in Madison, Wis. His death came at the end of a long sickness.

For many years Dr. Mitchell worked with Dr. George Ritter, widely known pioneer researcher in wood chemistry, and co-authored numerous research reports with Dr. Ritter. Since Dr. Ritter's retirement five years ago, Dr. Mitchell continued his research in the chemistry of wood. Many of the analytical methods he developed for the determination of lignin, hemicelluloses and other constituents of wood have come into general use in the paper, plastics, and wood chemical industries.

Shortly before his death, Dr. Mitchell co-authored a scientific paper on recent research on the development of new methods of purifying nitrocellulose for rocket fuels. This research was done in cooperation with the Army Ordnance Corps and the Badger Ordnance Works at Baraboo, Wis. The paper is scheduled for presentation at the annual meeting of the Technical Association of the Pulp and Paper Industry at New York City in February.

Orlando A. Meier, 53, superintendent of the General Box Co. plant in Kansas City, Mo., was killed on December 23 in an automobile accident near Peculiar, Mo. He was returning to Kansas City from a business trip in Lamar, Mo.

Reuben R. Sachs, 63, president of Sacks & Sons Carton Co., Brooklyn, N. Y., died January 5 while on vacation in Miami Beach, Fla. He was on the board of directors of the Paper Box Board of Trade.

Dr. Gerald Haywood, 59, technical assistant to the manager of technological research and development for West Virginia Pulp & Paper Co. and a leading authority on cellulose chemistry, died January 8 at the Potomac Valley Hospital, Keyser, W. Va., after a brief illness.

Active in West Virginia's research and development program for more than 40 years, Dr. Haywood held a number of important patents in the field of pulp and paper manufacture. His outstanding contributions were in the development of machine coating of paper and the use of pigments in paper fillers and coating formulations.

In recognition of his work in the field of cellulose chemistry, Dr. Haywood was awarded an honorary Doctor of Science degree from Centre College in 1952.

He began his career with the paper company in 1914. For 12 years Dr. Haywood worked under Dr. Viggo Drewsen's direction in the New York laboratory of the company. For four years during this period he attended night science courses at Columbia University.

In 1930 he returned to Luke to direct the company's research in the conversion coating of paper, a new field. His investigations led to two patents on the bar method of coating, now widely used in the industry. His range of activity grew to cover the entire field of cellulose chemistry and in 1938 he was named director of the Luke research laboratory of the company.

New Rotogravure Presses Announced by Inta-Roto

Inta-Roto Machine Co., Richmond, Va., is now taking orders for a new line of rotogravure presses. In announcing these presses, first to be manufactured by Inta-Roto for five years, President Albert H. Merz stated: "In 1950 we entered into an agreement with the Kidder Press Co. whereby we sold it certain of our assets, including the design for the rotogravure printing presses we had previously manufactured. In so doing we agreed not to compete for five years. Now, having fulfilled this agreement, we are free to build any type and size of rotogravure press.

"Basic designs for our new presses are complete. The plans, specifications, layouts and accessories are all new and the machines incorporate advanced features never before available in rotogravure presses.

"We will, of course, continue to make laminating, coating and coloring machines, flexographic presses, slitters, rewinders and special equipment for the converter, plus rendering a complete service in manufacture, plating and engraving of rotogravure cylinders."

The Inta-Roto Machine Co., and the affiliated Inta-Roto Engraving Corp., located on adjacent sites at Richmond's Byrd Airport, recently completed a $250,000 expansion of buildings and facilities, their second major expansion in the past three years.

Montmorency Opens Chicago Office

Montmorency Paper Co., Inc., has opened a branch office at 20 North Wacker Drive, Chicago 6, Ill., under the management of D. W. M. Smith, vice-president.

New Box Co. Chartered

Secretary of State Thad Eure has issued a charter to Marshville Box Co., Inc., Marshville, N.C. Authorized capital stock is $100,000, subscribed stock $300 by Garvis M. Southern, W. D. Griffin Jr. and J. M. Thomas, all of Marshville,

Introducing the New

POTDEVIN S.O.S. Bag Machine

for High-Speed Production of

SUPER MARKET CARRIER BAGS

Here is the latest development in paper bag machinery for mass production of the new super market self-opening-square carrier bag. It is entirely automatic, producing finished bags direct from rolls of paper at the highest rates of speed for this style of bag.

Multi-colored printed bags produced in one operation with a Potdevin Flexographic Press combined with bag machine.

The POTDEVIN Model 84RKW produces bags within the following range:

Minimum Tube Length	15"
Maximum Tube Length	28"
Minimum Bottom Width	3¼"
Maximum Bottom Width	6½"
Minimum Bag Width	7½"
Maximum Bag Width	12"
Minimum Paper Width	21"
Maximum Paper Width	38"

Side seam arrangement permits location of the seam anywhere between edge and center of tube.

The standard machine is supplied with the following:

- Parts for making one size of Super Market Bag.
- Motor and Reeves power unit.
- Side-seam arrangement.
- Carrier, presser and delivery portion.
- Guards and wrenches.
- Rotary cut-off.

Additional equipment available:

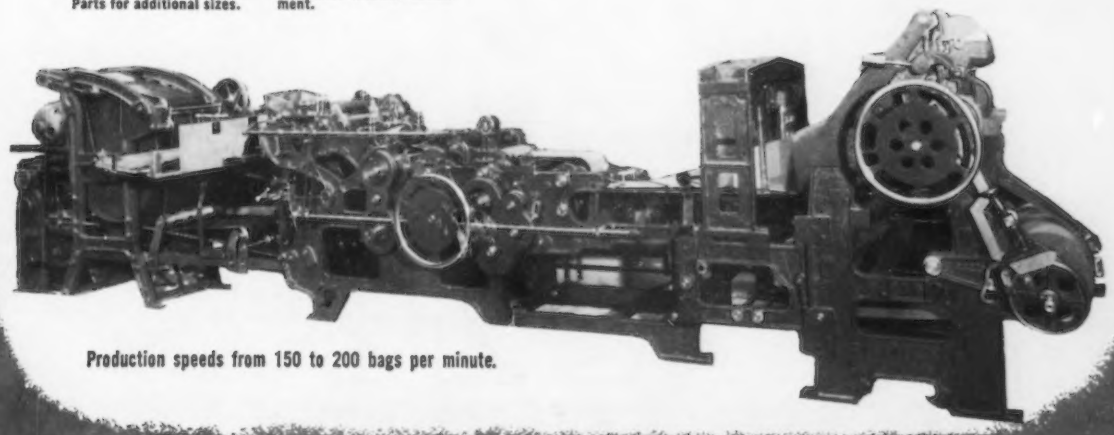
- Bag machine portion of aniline press chain drive.
- Tachometer—indicates productive speed of machine.
- Parts for additional sizes.
- Lining attachment.
- Hole punching and scoring device.
- Trademark printing attachment.

ESTABLISHED IN 1893 POTDEVIN

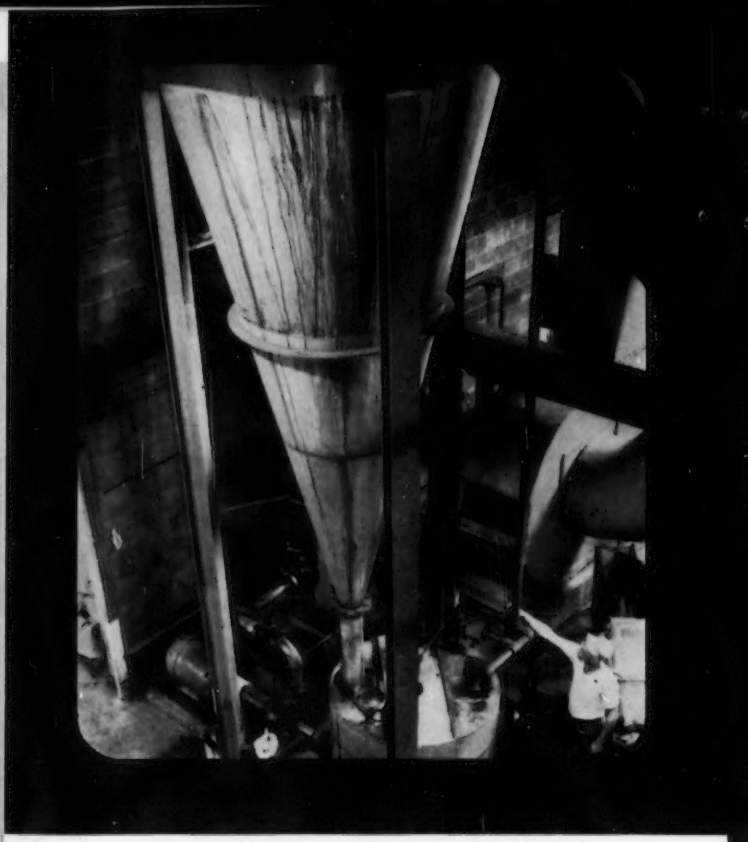
Write for complete information and demonstration arrangements.

POTDEVIN MACHINE CO.

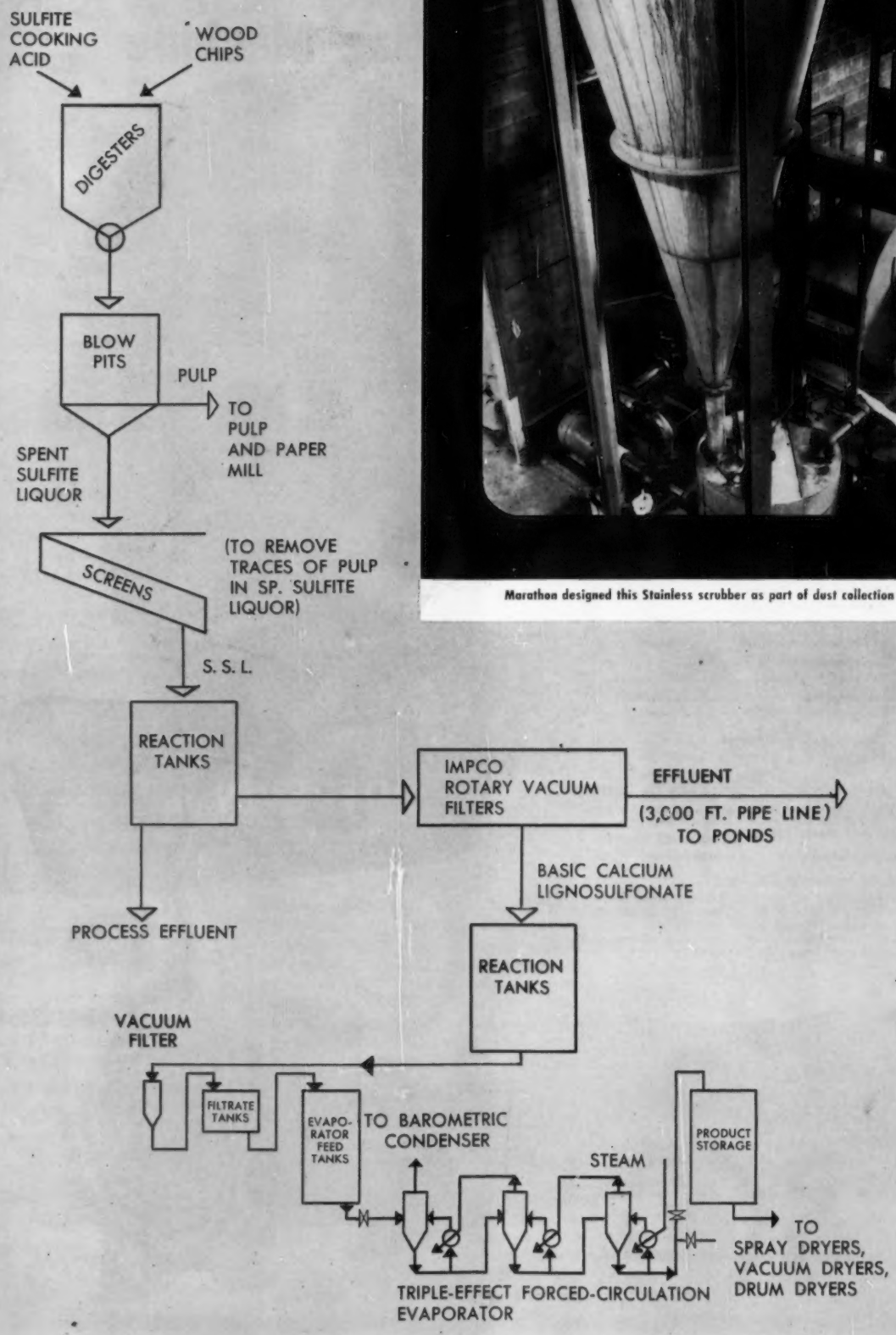
223 North Street Teterboro, N. J.

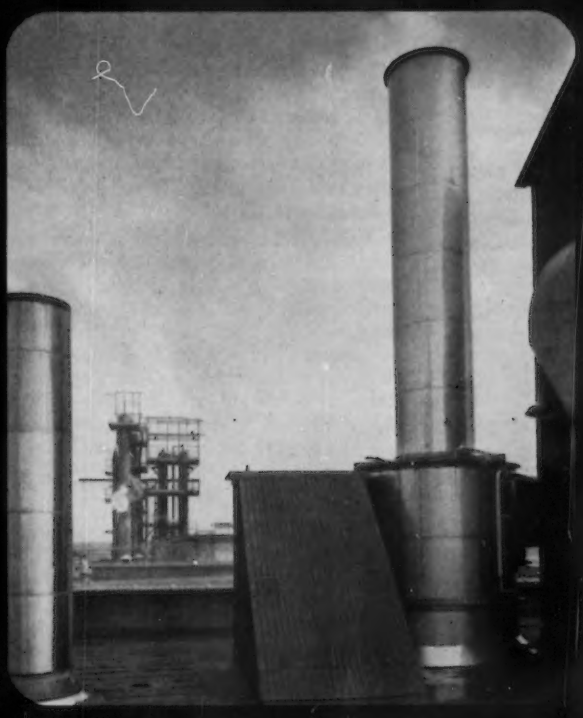


Production speeds from 150 to 200 bags per minute.

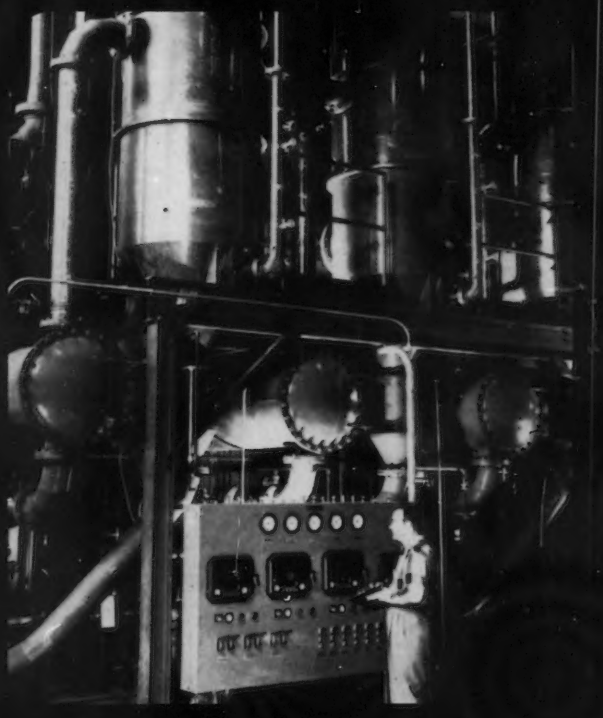


Marathon designed this Stainless scrubber as part of dust collection system.





Stainless Steel stacks vent corrosive liquid from dryers.



Operator checks controls on Stainless Steel evaporator.

How sulfite liquor waste is turned into profit

with the help of Stainless Steel

At its sulfite mill in Rothschild, Wis., the Marathon Corporation produces more than 50,000 tons of cellulose fibers per year. In the 1920's, Marathon started an intensive research program aimed at reducing river pollution from the spent sulfite liquor and recovering the 50% wastage of organic solids that resulted.

By fractionating the sulfite liquor, valuable lignosulfonates could be produced; but it was strictly a laboratory operation because the highly acid liquor corroded all normal materials—until Stainless Steel became available in the early 1930's.

Since it was completed in 1936, the new plant processes *all* the effluent from the Rothschild plant; and it has a capacity of 75 million pounds a year. It is the only plant in the world completely devoted to the production of fractionated lignosulfonates and *approximately 50% of the equipment is made from Stainless Steel.* This includes thousands of feet of 6-inch tubing, storage tanks, rotary vacuum filters, evaporators and dryers. Much of the Stainless is type 304 or 316. And much of it has been in continuous service for 15 years, compared to previous materials that disintegrated after 18 *months.*

When designing new process equipment, frequently nothing will save more money than the careful use of long-life Stainless Steel. For service-tested quality, specify USS Stainless Steel.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
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SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

UNITED STATES STEEL

NEWS OF SUPPLIERS

R. G. Millar

• RICE BARTON CORP. has appointed Robert G. Millar to the position of vice-president in charge of manufacturing. Mr. Millar was formerly president of Keleket X-Ray Corp., Covington, Ky.—a subsidiary of Tracerlab Inc. of Boston, Mass.

• DORR-OLIVER INC., Stamford, Conn. has announced plans for the integration of the Canadian operations of Dorr-Oliver with those of E. Long Ltd. of Orillia, Ontario, on January 1. The new organization will be known as Dorr-Oliver-Long Ltd.

• HERCULES POWDER CO. reports that David R. Wiggam, manager of development for Hercules' cellulose products department, retired at the end of 1955. Mr. Wiggam has been responsible, through his research overseas, for the introduction of several important Hercules chemicals.

The decision of Hercules officials to move into an entirely new field, for the production of Hi-fax, a high molecular weight polyethylene for use in plastics, was made following Mr. Wiggam's intensive study here and in Germany. Mr. Wiggam was the first to interest Hercules in the work of Germany's Professor Ziegler, which led to the company's eventual entry into the polyethy-

CHAS. T. MAIN, INC.
CONSULTING ENGINEERS
Process Studies, Design, Specifications and Engineering Supervision
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KALAMAZOO, MICHIGAN

Figures of the Week

PAPER PRODUCTION RATIO REPORT —American Paper & Pulp Ass'n. Figures

(Production as percent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Dec. 3	Dec. 10	Dec. 17	Dec. 24	Dec. 31
1955	98.9	99.7	100.3	89.7r	69.1
	Dec. 4	Dec. 11	Dec. 18	Dec. 25	Jan. 1, '55
1954	95.5	95.4	95.7	73.8	70.5

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1954	93.3	94.0	93.1	92.2	93.7	89.3	79.1	92.1	89.8	94.6	93.8	86.2	91.6
1955	93.6	96.6	97.9	98.0	99.3	95.4‡	87.3‡	96.7‡	92.8‡	98.7‡	98.9‡		

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1948	1949	1950	1951	1952	1953	1954	1955
Year to Date	92.2	84.0	96.2	99.2	90.2	93.2	92.1	95.6
Year Average	92.1	83.7	95.8	98.0	88.6	92.3	91.6	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

		Dec. 3		Dec. 10		Dec. 17		Dec. 24		Dec. 31			
	1955	98		102		102		101		56			
		Dec. 4		Dec. 11		Dec. 18		Dec. 25		Jan. 1, '55			
	1954	87		94		92		90		47			
Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1954	89	89	90	88	90	89	74	92	88	94	93	82	88
1955	92	95	96	94	97	97	84	99	97	102	101	92	96

Note: In the above tables all the ratios shown are on the basis of a normal 6 and 7 day capacity.

† Percents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Ass'n. Figures

ITEM	THIS WEEK ENDING Dec. 31, 1955	LAST WEEK ENDING Dec. 17, 1955	CUMULATIVE TO DATE January 1, 1955 to Dec. 31, 1955
% Activity	56%	102%	96%
Total Production (Tons)	211,615	296,461	14,013,251
Liner	75,474	100,210	4,796,279
Corrugating Material	39,112	44,578	2,164,572
Chip & Filler Board	5,306	6,392	304,014
Total Containerboard	119,892	151,180	7,264,865
Folding	31,505	51,169	2,564,195
Set-Up	7,818	12,832	658,984
Special Food Board	20,462	23,725	1,152,337
Other	31,938	57,555	2,372,870
Total Boxboard	91,723	145,281	6,748,386
Total Orders			
Received	290,959	229,795	
Unfilled At End of Week	577,240	568,726	

fene field and Ziegler chemistry. Many years ago, Mr. Wiggam was instrumental in the addition of ethyl cellulose to the Hercules chemical product list. More recently, he recommended CMC (sodium carboxymethylcellulose), which he found in Germany, as a product for Hercules to produce.

M. H. P. Morand

• DOW CHEMICAL CO. has advanced M.H.P. Morand to the post of manager of coating sales. He succeeds Floyd J. Gunn who has become manager of Dow's Los Angeles office.

Morand moved up after serving since 1953 as assistant to the manager of coatings sales. In his new capacity he will be responsible for marketing Dow coatings in the plastic, paint, paper, textile and other fields. His headquarters will be in Midland, Mich.

R. D. Kinny

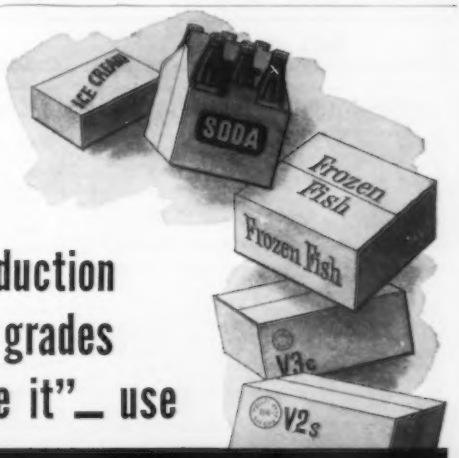
• PENNSYLVANIA INDUSTRIAL CHEMICAL CORP., Clairton, Pa. has established a sales residency in the Cincinnati area, working out of their Detroit office. Robert D. Kinny will represent Pennsylvania Industrial Chemical Corp. exclusively on all products available for sales and distribution in the Cincinnati area.

• MIXING EQUIPMENT CO. has advanced Dr. James Y. Oldshue to the position of director of research. Dr. Oldshue has been engaged in fundamental and applied research in fluid mixing since joining the Rochester, N. Y. firm in 1950. Prior to his promotion, he served as head of development engineering.

The author of several publications on fluid mixing, he is chairman of the Agitator Testing Procedure Committee of A. I. Ch. E. and is a member of several other technical societies. He conducts a graduate course in fluid mixing at the University of Rochester, Rochester, N. Y.

Dr. J. H. Rushton, long associated with Mixing Equipment Co. research and development, continues as a consultant to the research staff. Dr. Rushton is a professor of chemical engineering at Purdue University.

J. Y. Oldshue



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On container and carton stocks, too, Bitusize assures maximum water-resistance and high strength, coupled with real economy.

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SITUATIONS WANTED—One Dollar a line. Minimum charge $4.00. If repeated ½ rate will be charged for each consecutive repetition.

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OPPORTUNITIES—One Dollar a line. Minimum charge $4.00.

Classified advertising space may be also be purchased at $6.00 per single column inch. All classified advertisements are payable in advance. If box number is used—75 cents additional

Address replies to advertisements appearing under Box Number in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York 36, N. Y.

Help Wanted

CONFIDENTIAL EMPLOYMENT SERVICE

We will welcome an opportunity to be of service. If you are available for a position in paper or pulp manufacturing or paper converting, SEND US YOUR RESUME. Many attractive positions at excellent salaries are open for top-notch men. No fee to be paid unless you accept employment through us. Negotiations are confidential.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St. Liberty 2-6547 Boston 8, Mass.
J-16

ENGINEER

Waste Water Treatment Co. Requires Sales Engr. Experience in paper field preferred. Initially to supervise office sales, drafting, purchasing, expediting equip. mfg. Field engineering follows. Leader in field, rapidly expanding. Offering excellent opportunity. Reply Box 56-20 care Paper Trade Journal.
J-23

WANTED

Chemical Engineer or Chemist for Research and Development work in Pulp, Paper and Converting operations. Modern laboratory and equipment. S.E. location. Send complete resume with salary expected to Box 56-16 Paper Trade Journal.
J-23

TECHNICAL DIRECTOR

A well-established Machinery Company needs a Technical Director for Paper Mill Equipment. Expanding market offers excellent opportunity for a creative, hard-working Engineer, Mill Manager or Superintendent.

Excellent salary and liberal benefits.
Send resume to Box 56-21 care Paper Trade Journal.
J-30

Personnel Service Associates
115 State St., Springfield 3, Mass.
Tel. RE 6-4749

Offering personalized placement services for Administrative, Technical, Production and Sales Executives and Personnel. Pulp-Paper-Converting-Distribution Confidential.
J-16

MECHANICAL ENGINEER

Pulp and paper mill machinery manufacturer requires a mechanical design engineer. Minimum requirements: twelve (12) years heavy mechanical equipment design experience of which five (5) should be in pulp and paper mill machinery and/or pulp and paper mill engineering. Attractive position open to qualified person. Address Box 55-443 care Paper Trade Journal.
TF

Help Wanted

RESEARCH PHYSICIST

B.S. degree in Physics to assist in design of new instruments and testing equipment and to evaluate preliminary models for performance and final design purposes. Age 25-35. Good salary, usual benefits. Send resume to Personnel Manager, West Virginia Pulp and Paper Co., Luke, Md.
TF

PROJECT ENGINEER

Wanted by manufacturer of Pulp and Paper Mill machinery for work in Research and Development. Must be a graduate mechanical engineer with a minimum of five years' experience, including at least one year in machinery design, or as an engineer in the Pulp and Paper industry—New England location. Give detailed resume of experience. Reply Box 56-10, c/o Paper Trade Journal.
J-16

Help Wanted

WANTED
PLANT ENGINEER

Excellent opportunity for Mechanical Engineer with Cylinder Board making background. Must have proven record of good organizational and leadership experience. Mill located in New England. Please forward complete resume of education and positions held, stating salary required and date of availability. Reply to Box 56-19 c/o Paper Trade Journal.
J-23

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 46 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered: present position protected. Ask for particulars. R. W. BIXBY, INC., 563 Brisbane Bldg., Buffalo 3, N. Y.
J-16

WANTED—TOUR BOSS for night work on Fourdrinier Board Specialties. Metropolitan New York Area. All benefits. Send resume and salary expected first letter to Box 55-329 care Paper Trade Journal.
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IF YOU HAVE SURPLUS MACHINERY FOR SALE

YOU COULD SIGN AN EXCLUSIVE SALES AGREEMENT WITH ONE DEALER—but hardly any dealer is getting away with that old trick anymore.

YOU COULD SHIP IT TO A DEALER ON CONSIGNMENT—but that went out of style with the Model T.

YOU COULD OFFER YOUR MACHINERY TO ALL DEALERS TO BE SOLD ON A COMMISSION BASIS—and then keep your fingers crossed that two or more dealers don't claim the same customer.

YOU COULD MAKE AN OUTRIGHT SALE TO A CASH PURCHASER—the logical, profitable and proven method. It results in immediate disposal and removal from your mill.

YOUR GUARANTEED
CASH MARKET FOR SURPLUS MACHINERY

ROSS PAPER MACHINERY CO.

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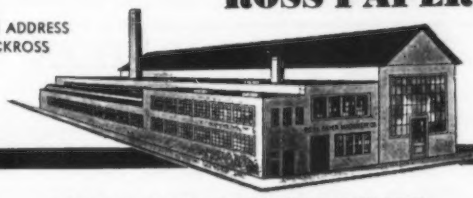
Telephone:—HUmboldt 2-2177 J-30

ROSS PAPER MACHINERY COMPANY

CABLE ADDRESS
JACKROSS



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BUY WITH CONFIDENCE — RPM SINCE 1919 — SELL WITH CONFIDENCE

USED PAPER MAKING & CONVERTING MACHINERY

Humboldt 2-2177

IMMEDIATE DELIVERY FROM AMERICA'S LARGEST INVENTORY OF PAPER MACHINERY

BALERS

1—Buffalo Baling Press—upstroke.

BEATERS

1—Dilts high speed iron tub. Roll 62" dia. x 54" face with 75 HP motor & controls.

CYLINDER MOULDS

3—136" face x 54" diameter—stainless steel covering—with 2 iron end vats.

CALENDER ROLLS

46—Chilled Iron Rolls—Assorted sizes.

CALENDER STACKS

1—Black Clawson 90" 7 roll with 3 spare rolls.
1—Black Clawson 82" 3 roll with doctors.
1—Black Clawson 82" 5 roll with doctors.
1—Farrel Birmingham 124"—9 roll stack—water cooled bearings.
1—Sandy Hill 84" 7 roll, with doctors.

DRIVES

3—Reeves #2F, #3 and #6.
8—Enclosed drives—various sizes.

DRYERS

7—43" face & 36" dia.—frames, gears & bearings.
4—52" face x 48" diameter—gears & bearings.
1—52" face x 24" diameter—gears and bearings.
23—84" face x 36" diameter, with gears.
1—88" face x 36" diameter.
1—104" face x 36" diameter.
1—104" face x 48" diameter.
10—109" face x 42" diameter.
1—110" face x 42" diameter, with bearings.
1—116" face x 36" diameter.
1—116" face x 48" diameter.
15—120" face x 48" diameter with gears, bearings and felt rolls.
1—124" face x 48" diameter.
1—126" face x 48" diameter.
13—127" face x 42" diameter.
1—130" face x 48" diameter.
9—160" face x 36" diameter, gears & bearings.
48—160" face x 48" diameter. Complete dryer section including felt dryers, felt rolls, etc.
36—132" face x 42" diameter with gears, bearings and frames.
18—58" face x 36" diameter. Complete with 2 deck frames, gears, bearings and steam joints and felt equipment.
23—80" face x 36" diameter. Complete with 2 deck frames, gears, bearings and steam joints and felt equipment.
64—46" face x 24" diameter. Complete with 2 deck frames, gears, bearings and steam joints and felt equipment.
24—46" face x 48" diameter. Complete with gears, bearings, steam joints and felt equipment.
4—90" face x 36" diameter, anti friction bearings.

FLAT SCREENS

3—8 plate Sandy Hill roller shoe with scrapers.
2—8 plate Bagley & Sewall with scrapers.
2—12 plate Sandy Hill, anti friction bearings.

JORDANS

1—E. D. Jones pony Jordans 3/16" stainless steel fillings.
1—E. D. Jones Pony Jordan, ball bearing, with stainless steel filling.
1—Smith & Winchester standard with granite filling.
1—Noble & Wood Bull Dog Jordan. Anti friction bearings with coupling and motor base.
1—Appleton #2—anti friction bearings.
2—E. D. Jones Standard Jordans—anti friction bearings.

KNIFE GRINDERS

1—132" Rogers with motor. Used 5 months.
1—130" Hanchett belt driven complete with coolant pump, and 2 spare wheels.
1—92" Seybold with motor.

LABORATORY EQUIPMENT

1—5 lb. Wood Tub Beater—Complete.
1—Biggs 6' diameter Rotary Digester 100# pressure.

MOTORS

12—125 H.P. Westinghouse synchronous enclosed. Brand new. 440 volt, 720 rpm forced air ventilation with starters.
1—Westinghouse 300 h.p., 388 r.p.m., 440 v., 3 phase, 60 cycle.

PASTING MACHINE

1—80" Pasting Machine, 2 unwind stands, 84" Hudson Sharp 3 roll paster (New 1946). Drying table, dryer section. Complete 23 dryers, 6 roll calender stacks, reel, rewinder.

PULP EQUIPMENT

3—2 ft. x 8 ft. type 300 Tyler Niagara stainless steel Chip Screens.
1—3 ft. x 8 ft. type 300 Tyler Niagara stainless steel Chip Screens.
1—Lannoye Pulper—enclosed drive.

PULP PRESSES

1—Hydraulic Machine Co. 250 tons 30" x 36" platen, 48" daylight, 30" stroke, 16" ram —upstroke. For baling dry pulp.

PUMPS

44—Centrifugal Pumps open & closed impellers.

REELS

1—Pusey & Jones 162" drum reel.
1—Downingtown 104" 2 bowl reel.

REFINERS

1—Dilts Hydrafiner.
1—24" Weiner Refiner—ball bearing.
2—34" Sutherland Disc Refiner, stainless steel discs.

ROLL GRINDERS

1—Lobdell Model 3MB for 30# diameter rolls —19 ft. 6" bed. Complete with crowning device and 15 h.p. main motor drive and 2 10 h.p. motor grinder wheel drives.

ROLLS—PRESS, COUCH, etc.

32—Press rolls, brass and rubber covered.
14—Couch rolls, brass and rubber covered.
250—Brass and steel carrying rolls.

ROTARY SCREENS

1—#2 Bird—Copper vat.
2—Bird #3A—Monel Vats.
9—Bird #2A with copper vats.
1—Bird #3A—copper vat—2 motors.

SAVEALLS

1—Shartle cylinder 36" dia. x 122" face with 5 HP motor & enclosed drive.

SHEETERS

1—Cameron 124" quick change double slitter assembly for board sheeters. Complete with 16 pneumatic slitters.
1—Moore & White simplex 114" sheeter with Maxson Layboy, overlapping delivery, 8 roll backstand motor and starter.
1—Hamblet 100" single knife with 3 slitters.
1—Hamblet 81" duplex with Erie Layboy 12 roll backstand and motor.
1—Hamblet 75" with layboy and backstands.
1—60" Hamblet.
2—Hamblet 110" single knife sheeters.
1—Beck 45" sheeter.

SHREDDERS

2—Mitts & Merrill Air Fluff Paper Shredder. Used 9 months.
1—Mitts & Merrill #17-2A paper shredder.
2—Taylor Stiles Giant Stock Shredders, Style 36.

SLITTERS AND WINDERS

1—Cameron 82" Model 10-5. 30" rewind. Equipped with shear cut slitters.
1—Dietz 81" Parent roll backstand—with automatic tensioning device.
1—Cameron 42" Model 6.
2—Cameron 165" Model 18—Complete with motor drive and roll ejector.
1—Cameron 194" Model 19. Anti-friction bearings, 2800 f.p.m., equipped with air operated quick change, constant tension and roll ejector.
1—Moore & White 66"—two drum.
3—Essex 42" center wind—30" duplex rewind. Anti friction bearing equipped.

STOCK PUMPS

1—Shartle 10 x 20 single plunger pump.
1—Moore & White 10 x 16 Triplex.
1—Beloit 8 x 10 Triplex.
1—Downingtown 8 x 18 triplex, with enclosed drives and motor.

SUCTION COUCH ROLLS

2—Beloit 25" diameter x 114" face, anti friction bearings, with stands. Direct drive.
1—Sandusky suction couch 25" diameter x 128" drilled face.
1—Sandusky suction couch 18" diameter x 122" drilled face.
1—Sandusky 30" diameter x 162" drilled face complete Trunnion Roller Bearing.
1—Sandusky 22" diameter x 135" drilled face trunnion roller bearings.
1—Sandusky 18" diameter x 113" drilled face.

SUCTION PRESS ROLLS

1—Beloit 113" drilled face x 22" diameter—anti friction bearings.

SUPERCALENDERS

1—Norwood 30" 5 roll, complete with motor drive.

TISSUE AND TOWELING MACHINE

1—B & S 90" single cylinder machine. Complete including pumps, piping, valves, enclosed drive and VS motor drive. Full details on request.

TRIMMERS POWER BACK GAUGES

1—Seybold 94" Model 15 ZJ.
1—Seybold 64" Model 12-Z.
1—Seybold 56" Dayton—10 knives.
1—Seybold 84" Dayton with motor and spare knives.
1—Seybold 74"—Model 8ZG with motor.

VACUUM PUMPS

1—Nash H-3 with 5 h.p. motor.
3—Nash H-4.
1—Nash L-3 with totally enclosed 5 h.p. motor.
1—Nash L-5.

VOITH INLETS

1—New Valley Iron Works 153" x 36" monel lined inlet and head box.
2—Valley Iron Voith Inlets, adjustable 83" to 86"—Brass lip, stainless steel apron.
1—Valley Iron Works—for 113" wire with wooden head box.
1—Valley Iron Works 151" stainless steel inlet and head box.
1—Bagley & Sewall 144" stainless steel clad high speed inlet and headbox.

VORTRAPS

7—Nichols 4" stainless steel Vortraps—rubber lined heads.

WET MACHINES

1—Rogers 72" x 48" Wet Machine. Double press sections.

YANKEE DRYERS

1—10 ft. diameter x 132" face with bearings
1—Beloit 12 ft. diameter x 140" face—75 lb. steam pressure.

BOWATERS SOUTHERN PAPER CORPORATION

South's largest newsprint manufacturer has positions available in following Engineering fields:

• Electrical • Civil • Mechanical • Also Draftsmen

Engineering staff being enlarged because of extensive expansion program. Openings for experienced and recent graduates for office and field work. Duties include cost estimating, design layout, studies of operational problems, field supervision, etc. Starting salary based on qualifications with periodic merit increases. Complete insurance, retirement, and vacation programs established. Mills are located in the heart of the Tennessee Valley and are near established communities, offering excellent residential and recreational facilities. All replies will be treated in confidence. Qualified applicants will be interviewed locally by Company representatives or will visit our offices at Company expense. Reply immediately submitting summary of experience to:

Industrial Relations Department

BOWATERS SOUTHERN PAPER CORPORATION

CALHOUN, TENNESSEE

J-16

WANTED

PAPER MILL SUPERINTENDENT
POWER PLANT ENGINEER

For New Kraft Pulp and Paper Mill In Central American Republic

Very experienced men thoroughly familiar with modern high speed Fourdrinier Paper Machines and Kraft Pulp and Paper Mill equipment, over 45 years of age, in good health preferred.

Please be sure to give complete resume of background including Birthplace, Age, Education, Experience and Salary Desired.

Excellent opportunity for older men desiring ideal climate, environment and low cost living conditions. Address Box 56-8 care Paper Trade Journal.

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PAPER BROKER SALESMEN WANTED

WE WANT MEN EXPERIENCED AT BUYING AND SELLING THEIR OWN TONNAGE. THESE MEN CAN ESTABLISH AND OPERATE SALES OFFICES IN PRINCIPAL CITIES OR WORK FROM HOME OFFICE. EXCELLENT FUTURE WITH GROWING CO. REPLY CONFID. BOX 55-438 CARE PAPER TRADE JOURNAL. TF

TOUR FOREMAN—Age 25 to 40—for progressive Midwest paperboard mill producing 500 tons folding, test liner and specialty grades daily. In reply state age, paper mill experience and qualifications to Box 55-446 care Paper Trade Journal. J-16

Situations Wanted

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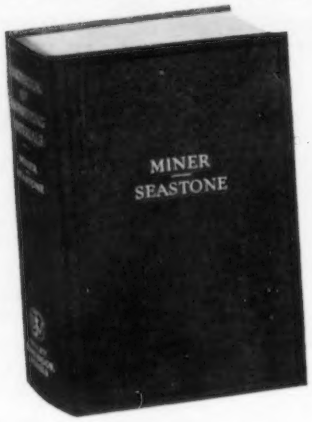

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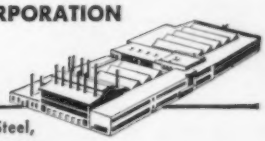

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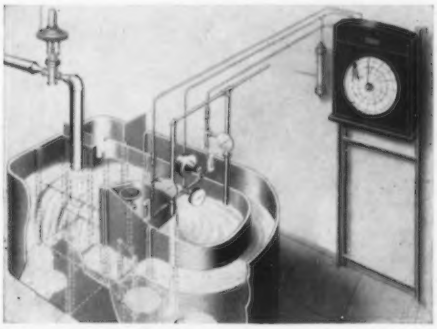

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INDEX TO ADVERTISERS

PAPER TRADE JOURNAL

A

Acme Steel Co. — Albany Felt Co. — Allis-Chalmers 10 — Aluminum Co. of America — American Bitumuls & Asphalt Co. 47 — American Cyanamid Co., Paper Chemicals Dept. — American Enka Corp. — American Steel & Wire Co. — Antara Chemicals, Sales Div. Gen. Aniline & Film Corp. — Apmew, Inc. — Appleton Machine Co., The — Appleton Wire Works — Armco Drainage & Metal Products — Armco Steel Corp. — Armstrong Machine Works — Asten-Hill Mfg. Co. —

B

Babcock & Wilcox Co. — Bahnson Co. — Bahr Bros. Mfg. Co. — Bailey Meter Co. — Barrel, Wm., Co. — Bauer Bros. Co. 37 — Beloit Iron Works Co. — Bird Machine Co. 17 — Bixby, R. W., Inc. 48 — Black-Clawson Co. 53 — Bolton, John W., & Sons, Inc. — Borden Co. — Bowsher Co., N. P. — Brandon Sales, Inc. — Brown Co. — Buffalo Electro Chem. Co., Div. of Food Machy. & Chem. Co. — Buffalo Forge Co. — Buffalo Pumps, Inc. 31

C

Cady, E. J., & Co. — Calgon, Inc. Back Cover — Cambridge Instrument Co. — Cameron Machine Co. — Carbon Corp. — Carthage Machine Co. — Central National Corp. — Chemipulp Process, Inc. — Chicago Bridge & Iron Co. 2 — Cities Service Oil Co. — Classified Advertising 48 — Clearing House 48 — Cleveland Worm & Gear Co. — Columbus-Geneva Steel Div. 44 & 45 — Columbia-Southern Chem. Corp. Sub. of Pittsburgh Plate Glass Co. — Combustion Engrg. Co. — Corn Products Sales Co. — Crane Co. 25 — Crucible Steel Corp. of America —

D

DeLaval Separator Co. — DeZurick Shower Co. — Diamond Alkali Co. — Dicalite Div., Great Lakes Carbon Corp. — Dietz Machine Works — Dilts Machine Works 53 — Dodge Mfg. Co. — Dow Chemical Co. — Dowell, Inc. — Draper Bros. Co. — du Pont, E. I., de Nemours & Co., Dyestuffs Dept. — du Pont, E. I., de Nemours & Co., Electrochemical Dept. — du Pont, E. I., de Nemours & Co., Organic Dept. —

E

Eaton Manufacturing Co. — Ebasco Services, Inc. — Egan, Frank W., & Co. 52 — Elixman Paper Core Co. — Emerson Mfg. Co. — English China Clays Sales Corp. —

F

Falk Corporation — Farrel Birmingham Co., Inc. 4 — Farval Corp. — Ferguson, H. K., Co. — Fitchburg Screen Plate Co. 53 — Foxboro Co. —

G

Geigy Dyestuffs Div., Geigy Chemicals Corp. — General Dyestuffs Co. — General Electric Co. — Gibbs-Brower Co. — Gilbert & Nash Co. — Glidden Company — Goodrich Chemical Co. — Goodyear Tire & Rubber Co. — Gottesman & Co. — Graver Tank & Mfg. Co. — Grinnell Co., Inc. 39 — Gulf Oil Corporation — Gurley, W. & L. E. —

H

Hagan Corp. Back Cover — Hall, Thomas W., Inc. 50 — Hamlet Machine Co. — Hendrick Mfg. Co. — Hercules Powder Co. 6 — Heyden Chemical Co. — Holyoke Machine Co. — Hooker Electrochemical Co. — Huber, J. M., Corp. — Hudson-Sharp Machine Co. — Hungerford & Terry, Inc. — Huyck, F. C., & Sons —

I

Improved Machinery, Inc. — Inta-Roto Machine Co. — International Wire Works 42

J

Jenkins Brothers — Jenkins, M. W., Sons, Inc. — Johns-Manville Corp. — Johnson Corp., The — Johnson, Alvin H., & Co. — Jones, E. D., & Sons Co. 3

K

Knox Woolen Co. — Koppers Company 8

L

Langston, Samuel M., Co. — Lindsay Wire Weaving Co. — Link-Belt Co. — Lockport Felt Co. — Lodding Engineering Co. — Lukens Steel Co. — Lunkenheimer Co. — Lyddon & Co. —

M

Magnus Metal Co. 53 — Magnuson Products Corp. — Main, Charles T., Inc. 46 — Manchester Machine Co. — Manheim Mfg. & Belting Co. — Mead Board Sales, Inc. — Mead Pulp Sales, Inc. — Merrick Scale Co. — Metallizing Engrg. Co. — Minerals & Chem. Corp. — Monsanto Chemical Co. — Moore & White Co. — Morden Machines Co. — Mount Hope Machinery Co. — Murray, D. J., Mfg. Co. —

N

Nash Engineering Co. — National Aluminate Co. — National Paper & Type Co. — National Starch Products, Inc. — National Tube Co. 44 & 45 — Naylor Pipe Co. — Nichols Engrg. & Research Corp. — Nopco Chemical Co. — Nordstrom Valve Div. of Rockwell Mfg. Co. — Norton Co. —

O

Ohio Injector Co. 41 — Oldbury Elec. Chem. Co. — Olin Mathieson Chem. Corp. 33 — Owen Bucket Co. —

P

Paper Converting & Finishing Co. 52 — Paper Converting Mch. Co. — Parsons & Whittemore — Penick & Ford, Ltd. — Pennsylvania Industrial Chem. Corp. — Perkins, B. F., & Son, Inc. — Perkins Goodwin Co. — Personnel Service Associates 48 — Pioneer Paper Stock Co. — Pittsburgh Piping & Equip. — Pittsburgh Plate Glass Co. — Poirier Control Co. 42 — Potdevin Machine Co. 43 — Poweli Valves 7 — Price & Pierce, Ltd. — Pusey & Jones Corp. —

R

Railway Supply & Mfg. Co. — Raymond, Chas. P., Service, Inc. 48 — Read Standard Corp., Bakery Chem. Div. — Read Standard Corp., Blower Stoker Div. — Record Fdy. & Machine Co. — Red Ray Mfg. Co. — Reliance Elec. & Engrg. Co. — Rem-Cru Titanium Inc. — Restigouche Corp. — Rice Barton Corp. — Ridge Tool Company — Riedel, Gus, & Son 46 — Riegel Paper Corp. — Rockwell Mfg. Co. — Rogers, Sam'l. C., & Co. — Rohm & Haas Co. — Ronningen-Petter Co. — Roosevelt Paper Co. — Ross, J. J., Co. 51 — Ross, J. O. Engineering Co. —

Ross-Midwest Fulton Co. — Ross Paper Machinery Co. 48 & 49 — Rust Engineering Co. —

S

Sandusky Fdy. & Mch. Co. — Seaboard Air Line R. R. Co. — Shartle Bros. Machine Co. — Shuler & Benninghofen — Sigmamotor Inc. — Sirrine, J. E., Co. — Smidth, F. L., & Co. — Smith & Winchester Mfg. Co. — Socony Mobiloil Co., Inc. — Sonoco Products Co. — Stebbins Engrg. Co. — Stevens, Charles R., Inc. — Stone & Webster Engrg. Corp. — Stowe-Woodward — Sun Oil Co. — Swenson Evaporator Co. Front Cover

T

Taylor Instrument Co.'s — Taylor Stiles & Co. — Tennessee Coal & Iron Co. 44 & 45 — Texas Co. — Texas Gulf Sulphur Co. — Thiele Kaolin Co. — Thomas Paper Stock Co. 52 — Timken Roller Bearing Co. — Titanium Pigment Corp. — Torrington Co. — Towmotor Corp. — Tracerlab, Inc. — Trend Tube Co. — Tube Turns Plastics —

U

United Carbon Co., Inc. — United Paper Machinery Corp. — U. S. Rubber Co. 11 — United States Steel Export Co. 44 & 45 — United States Steel Supply Co. 44 & 45 — U. S. Steel Corp. 44 & 45

V

Valley Iron Works Co. 35 — Vanderbilt, R. T., Co. — Vapo Systems —

W

Waldron, John, Corp. — Walworth Co. 12 — Weber, H. G., & Co., Inc. — West End Chemical Co. — Westinghouse Electric Corp., Sturtevant Div. — West Virginia Pulp & Paper Co. 53 — Weyerhaeuser Timber Co. — Wheeler Roll Co. — Whiting Corp. Front Cover — Wiegand, Edwin L., Co. — Williams Apparatus Co., Inc. — Williams-Gray Co. — Wisconsin Wire Works — Wyandotte Chemicals Corp. — Wyatt Metal & Boiler Works 55

Y

Yale & Towne Mfg. Co. —

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